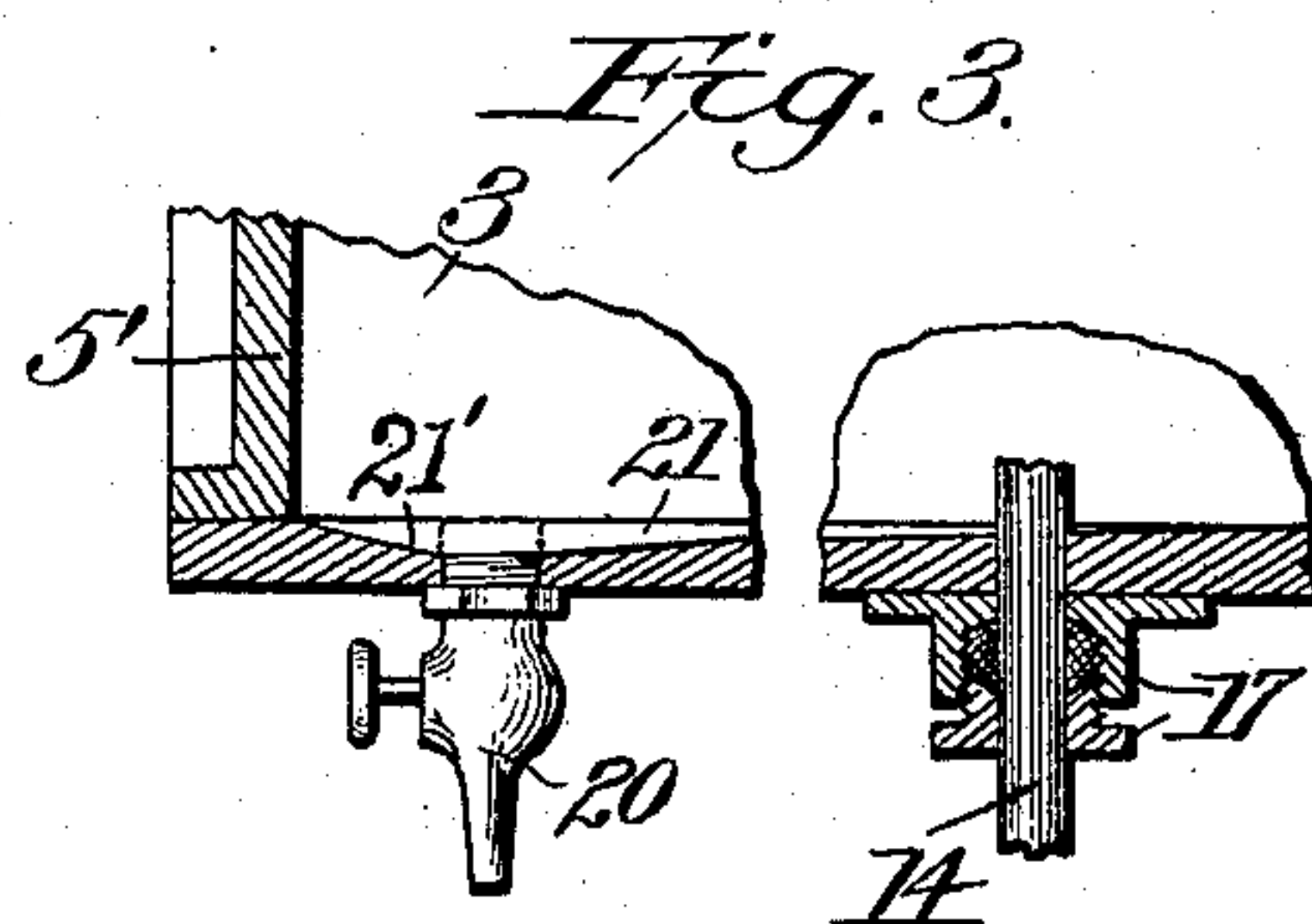
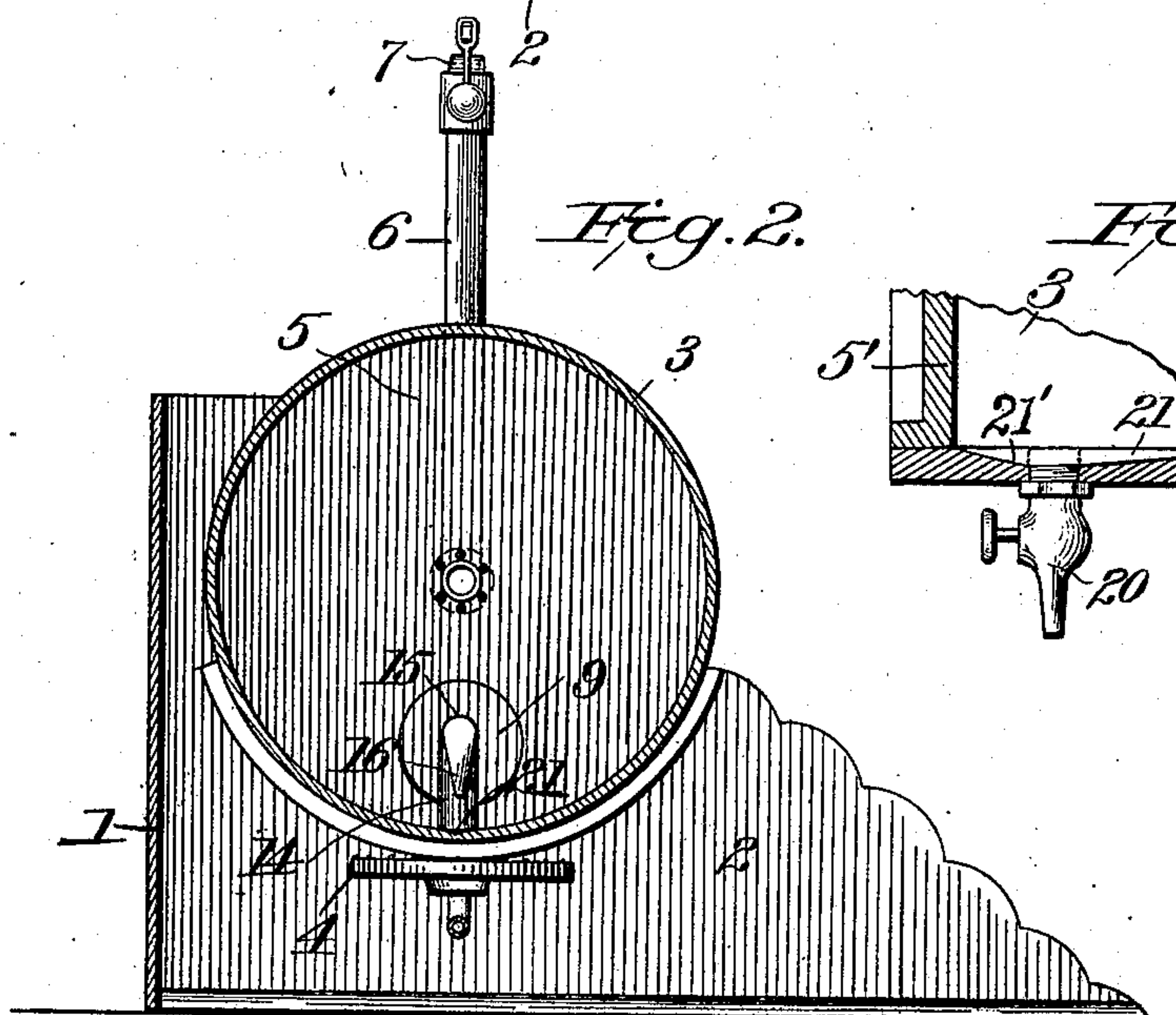
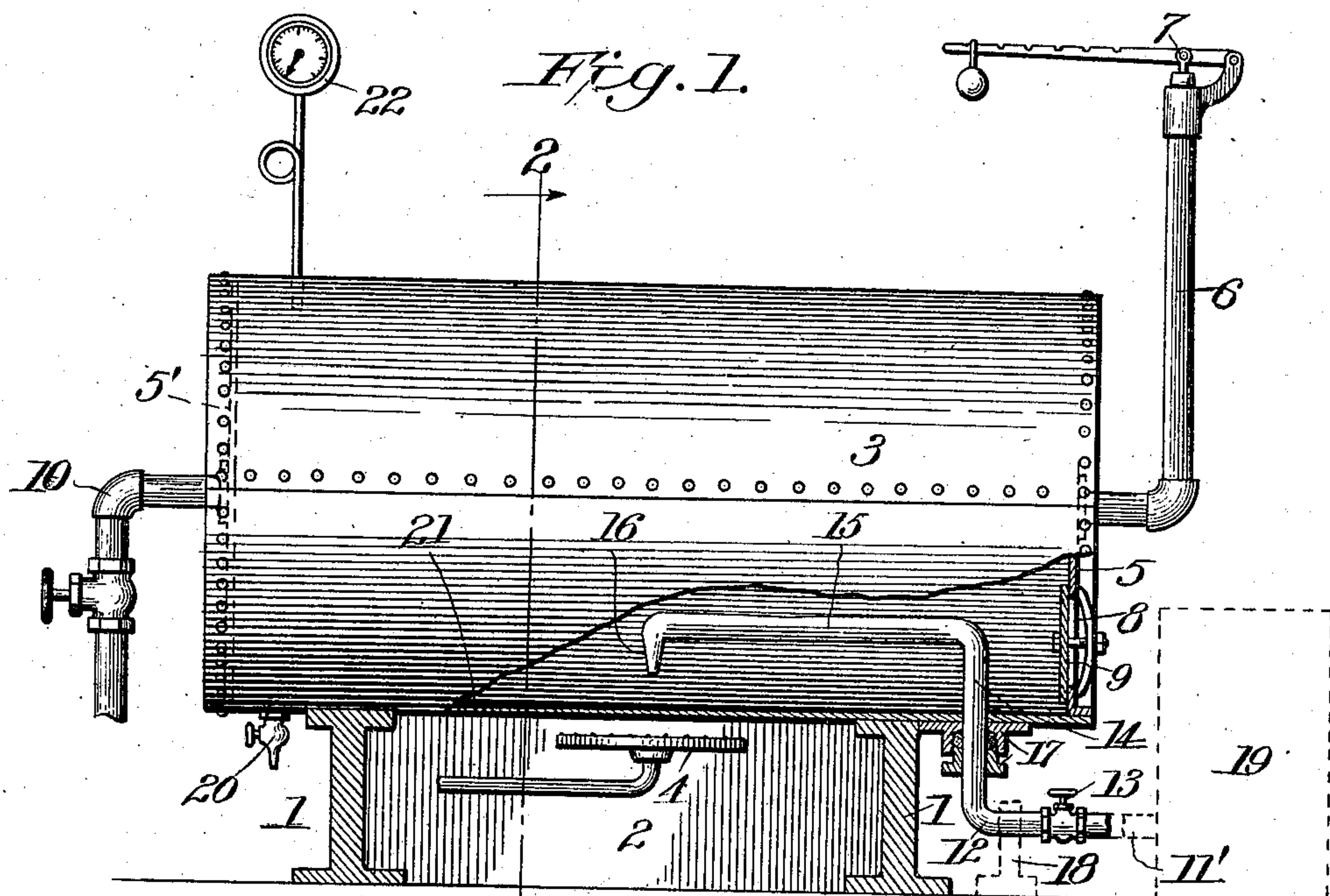


No. 867,631.

PATENTED OCT. 8, 1907.

C. BAKEHAUS.
STEAM GENERATOR.
APPLICATION FILED MAR. 28, 1907.



Inventor

Witnesses

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UNITED STATES PATENT OFFICE.

CHARLES BAKEHAUS, OF SIGOURNEY, IOWA.

STEAM-GENERATOR.

No. 867,631.

Specification of Letters Patent.

Patented Oct. 8, 1907.

Application filed March 28, 1907. Serial No. 365,035.

To all whom it may concern:

Be it known that I, CHARLES BAKEHAUS, a citizen of the United States, residing at Sigourney, in the county of Keokuk and State of Iowa, have invented certain
5 new and useful Improvements in Steam-Generators, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in steam generators.

10 The object of the invention is the provision of means for facilitating the instantaneous generation of steam.

Another object of the invention is the improvement of the construction of a generator, which is provided with means for receiving water in small quantities and
15 the instantaneous generation of steam from said water, without the employment of tubes or flues, which are a part of an ordinary generator.

With these and other objects in view, the invention consists of certain novel constructions, combinations,
20 and arrangements of parts, as will be hereinafter fully described and claimed.

In the drawings: Figure 1 is a view in side elevation of a generator constructed in accordance with the present invention, part of which is shown in section. Fig.
25 2 is a transverse, sectional view taken on line 2, 2, Fig. 1, and looking in the direction of the arrow. Fig. 3 is a fragmentary, sectional view of the boiler.

Referring to the drawings, 1 designates a support or frame, within which is formed the fire-box or furnace 2.
30 Supported upon the frame or foundation 1, is a cylindrical shell or receptacle 3. Any suitable means may be employed in the furnace 2 for heating the cylindrical receptacle 3, as for instance, a gasolene burner 4. Owing to the cylindrical structure of the receptacle 3
35 the flames from the burner 4, or any other heating means, are permitted to pass up around the side of the receptacle and thereby heat the greater portion thereof. It will be obvious that if the flames are of sufficient size, owing to the cylindrical structure of the receptacle 3, the flames may come in contact with over half of
40 the receptacle, which is not true of an ordinary receptacle provided with a flat bottom, or a bottom provided with rounded edges; this direct contact of the flames with the greater portion of the receptacle is an important advantage which I obtain.

My cylindrical receptacle is provided with vertical ends 5 and 5', and this structure is of importance. The pipe 6 extends through, preferably, the central portion of the end 5, and said pipe is provided at its
50 upper end with a safety valve 7. A comparatively large opening 8 is formed in end 5, preferably between the lowest portion thereof and pipe 6. A door 9, constituting closing means, is employed for closing the opening or port 8. This closing means or door 9 is
55 made steam-tight. I preferably employ this opening 8 in my receptacle 3, so that the interior thereof may be

cleaned of any accumulated scale, or, in constructing the apparatus, entrance into the interior of the receptacle 3 may be permitted for facilitating the assembling
60 of the different parts of the apparatus.

Extending, preferably, from the center of the end 5' of the receptacle 3, is a valved outlet steam-pipe 10.

The water or liquid is discharged into the receptacle 3 through the medium of a pipe or tubing 11. The horizontal portion 12 of the tubing is provided with a valve
65 13, and the vertical portion 14 of said pipe 11 extends through, preferably, the extreme lower portion of the receptacle 3, and this portion 14 terminates at its upper end in a horizontal portion 15, which horizontal portion 15 terminates at its outer end, preferably, in a depend-
70 ing nozzle 16. I preferably form the portion 15 of sufficient length to place the discharge nozzle 16 near the center of the receptacle 3, and directly over the heating means or burner 4. For the purpose of making the connection between the lower portion of the receptacle
75 3 and the portion 14 of pipe 11 steam-tight, I secure to the outside of the receptacle 3, a stuffing-box 17.

The receptacle 3 may be secured upon the support or framework 1 against any independent rotary movement with respect to said support 1, by reason of the peculiar
80 positioning and structure of the pipe 11, as it will be obvious that fastening means, as for instance, a bracket, shown in dotted lines at 18, may be secured to any suitable support and engage or surround the lower horizontal portion 12 of the pipe 11, thereby fixedly securing
85 the receptacle 3 upon its support. Furthermore, by positioning the pipe 11 in the extreme lower portion of the receptacle 3 and contiguous to and between the support or framework 1 and the opening 8 of the side 5, the pipe 11 will be heated by the heating means in the fur-
90 nace 2, sufficiently to warm the water contained therein, as well as permit the portions 14, 15, and 16 of the pipe 11 to be examined through the opening 8, for keeping said pipe in perfect working condition. By reason of the positioning of the pipe 11 contiguous to the fur-
95 nace, but not in contact therewith, the water will be heated sufficiently to increase the efficiency of my apparatus, as the water will be of such a temperature as to be more quickly generated into steam, when coming in contact with the hot surface of the receptacle above
100 the heating means 4. Before the water enters pipe 11, it may be placed in a heated condition in, or it may be heated in receptacle 19, as shown in dotted lines, and as this receptacle 19 is connected by a pipe 11', to the valved pipe 11, the heated water from the receptacle or
105 tank 19 will be discharged into the receptacle 3, under pressure. However, the amount of water discharged through pipe 11 into the receptacle 3, is controlled or regulated by valve 13, so that if I desire, water may be discharged into receptacle 3 in a certain amount and at
110 predetermined intervals. For instance, a very small quantity every few seconds. I may employ a pump

(not shown) for retaining the water in receptacle or tank 19, at a given pressure.

If it is desired to have the receptacle 3 comparatively dry, from one period of use to another, this may be accomplished through the medium of the valved drain-cock 20. It will be apparent that after the heating means 4 has been extinguished and the receptacle is allowed to cool, such steam as is in the receptacle 3, will be condensed, and thereby cause a certain amount of water to remain in said receptacle until the next time it is used. However, by opening the valve of the cock 20, the water will be completely drained from the receptacle, thereby preventing any injurious result. To facilitate the draining of the water from the receptacle, I preferably form, in the inner face thereof, and at the lowest portion, a shallow groove 21 running from near the end 5 to the cock 20, and increasing in depth from said end 5 to said cock, as is clearly shown in Fig. 3. Between the end 5' and cock 20, I also form a shallow groove 21', which increases in depth from end 5' to said cock. Both of the grooves 21 and 21' open upon the cock, and thereby cause the slightest quantity in the receptacle to be discharged through said cock. This is an important feature of my apparatus, as it will enable the receptacle to be drained completely, as the cylindrical structure of the same will direct all of the water to the grooves 21 and 21'.

A suitable indicator 22 is carried by the receptacle 3, preferably upon the upper portion thereof. When the apparatus is in operation, the receptacle or shell 3 is sufficiently heated as to instantaneously generate or "flash" the water into steam, thereby forming really a gas, which, when sufficient pressure has been obtained in the receptacle 3, may be allowed to pass through the valved outlet pipe 10, for utilization.

Owing to the extremely simple structure of my apparatus, a great amount of fuel is saved. Furthermore, it is not necessary to wait a considerable time for the water to heat, but steam can be nearly instantaneously generated as soon as the burner 4, or other suitable heating means, is started, which is of great importance, as considerable time is, therefore, saved.

My apparatus may be used, not only for generating steam for engines, but also for heating houses, buildings, etc.

What I claim is:

1. In an apparatus of the class described, the combination with a support, of a cylindrical receptacle carried by said support, said receptacle provided with a vertical end, a safety valve carried by said vertical end, said vertical end provided with an opening between said safety valve and the lower portion of said receptacle, removable means closing said opening, a supply pipe extending through the lower portion of said receptacle between said opening and said support, and means engaging said supply pipe outside of said receptacle for securing said receptacle against independent movement upon said support.

2. In an apparatus of the class described, the combination with a support, of a cylindrical receptacle carried by said support, a drain-cock formed upon said receptacle between its ends, said receptacle provided with grooves formed in its inner face and extending from near its ends to said drain-cock and opening into the same, each groove increasing in depth from one end of the receptacle to said drain cock, means for supplying liquid to said receptacle, and heating means for said receptacle.

3. In an apparatus of the class described, the combination with a support provided with a fire-box or furnace formed therein, a receptacle carried by said support, of a supply pipe extending into said receptacle, fastening means positioned contiguous to said receptacle and engaging said supply pipe for preventing movement of said receptacle upon said support, and means for supplying liquid to said supply pipe.

4. In an apparatus of the class described, the combination with a support, of a cylindrical receptacle carried by said support, a drain-cock formed upon the lowest portion of said receptacle between its ends, said receptacle provided with horizontal grooves formed in the inner face of the lowest portion thereof, the grooves formed upon opposite sides of said drain-cock and extending from near the ends of the receptacle and opening into said drain-cock, means for supplying liquid to said receptacle, and means for heating said receptacle.

5. In an apparatus of the class described, the combination with a support provided with a furnace formed therein, of a horizontal, cylindrical receptacle carried by said support, a supply pipe provided with a vertical portion, the vertical portion extending through the lowest portion of said receptacle, said supply pipe provided with a plurality of horizontal portions projecting only in opposite directions from the upper and lower ends of the vertical portion, the horizontal portions at the upper end of said vertical portion positioned within said receptacle and terminating at its inner end in a downwardly-extending nozzle, the nozzle adapted to discharge liquid only upon the receptacle over the central portion of the furnace, the horizontal portion of the supply pipe integral with the lower end of the vertical portion positioned outside of said receptacle and extending outwardly beyond one end thereof, whereby a reservoir or source of liquid supply may be connected thereto.

6. In an apparatus of the class described, the combination with a support, of a cylindrical receptacle carried by said support, a supply pipe provided with a vertical portion and with an inner and an outer horizontal portion, said inner and outer horizontal portions extending in opposite directions, the vertical portion positioned contiguous to one of the ends of said receptacle and extending through the body of the receptacle, the inner, horizontal portion extending parallel with the body of the receptacle and provided at its inner end with a downwardly-extending nozzle adapted to discharge liquid upon the inner face of said receptacle only over the central portion thereof, the outer horizontal portion extending outwardly from said support and projecting beyond one end of said receptacle, fastening means engaging the outer horizontal portion of said supply pipe, and means engaging the outer portion of said supply pipe for supplying liquid thereto.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

CHARLES BAKELIAUS.

Witnesses:

WM. A. BELL,
F. L. GOELDER.