No. 694,584. Patented Mar. 4, 1902.

O. SELG & C. GUNTRUM.

PROCESS OF CONVERTING WORT INTO BEER.

(Application filed Aug. 19, 1901.)

(No Model.) 2 Sheets—Sheet 1.

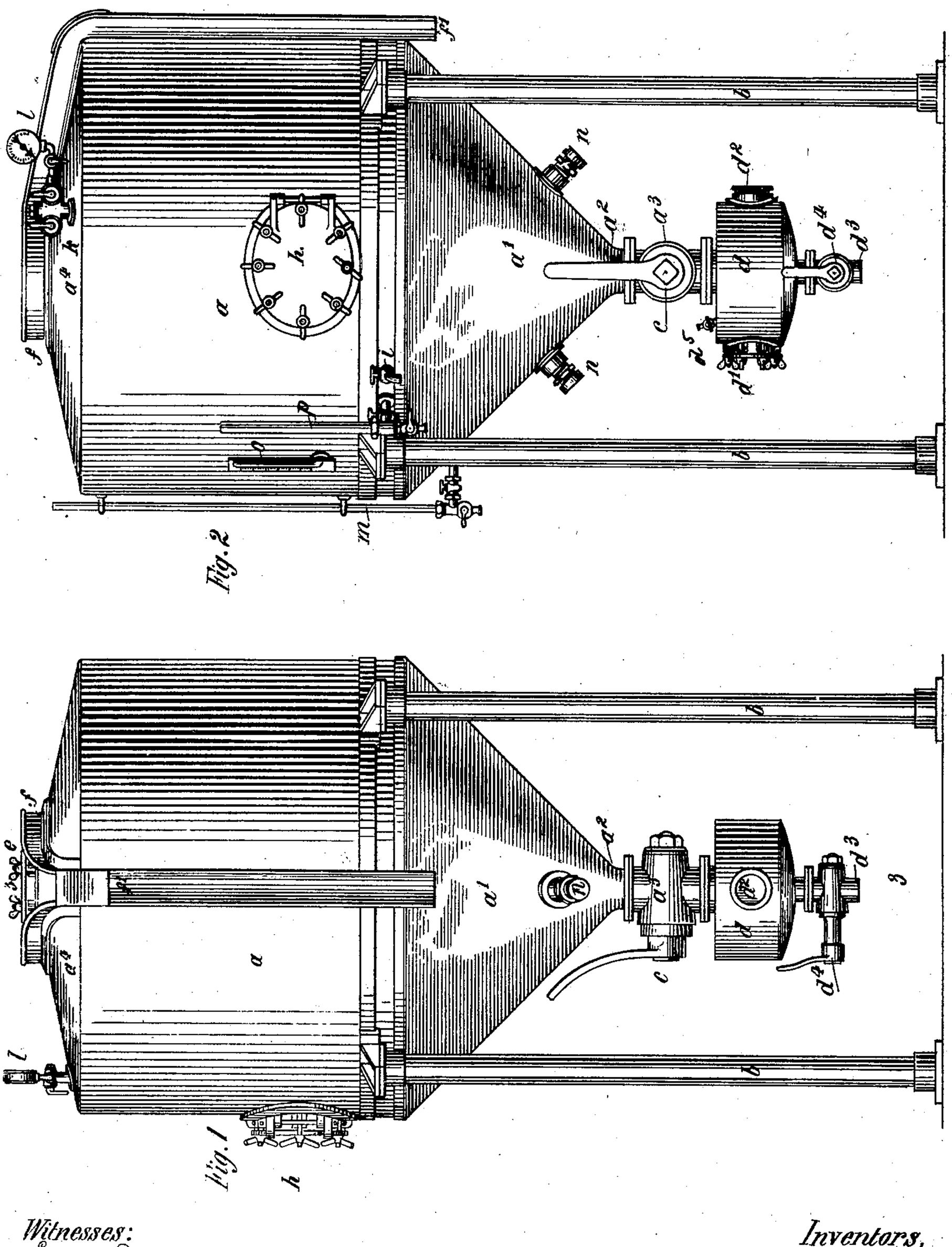

Fig. 2

Fig. 1

Witnesses:
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Inventors,
Otto Selg &
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Fig. 4

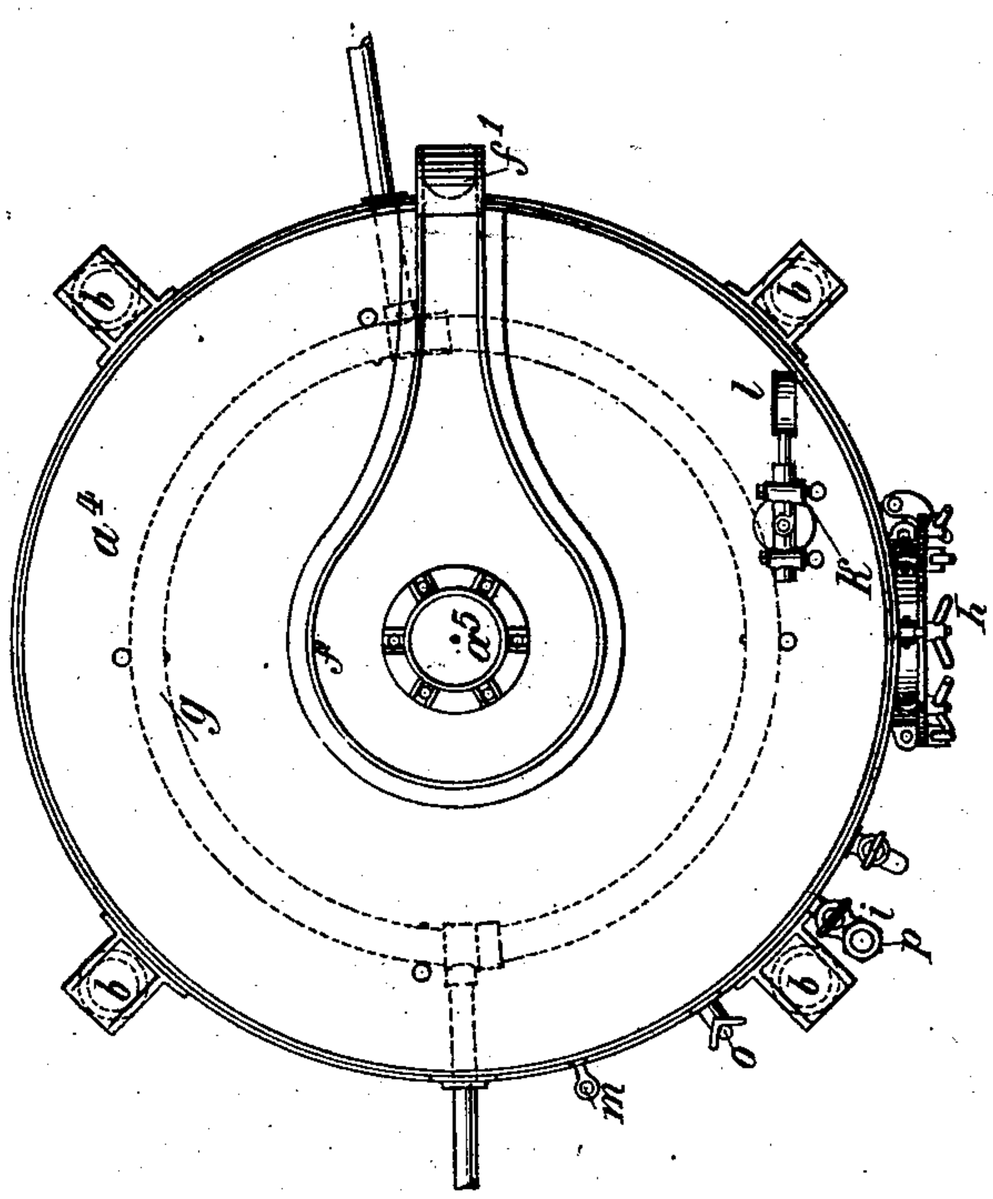
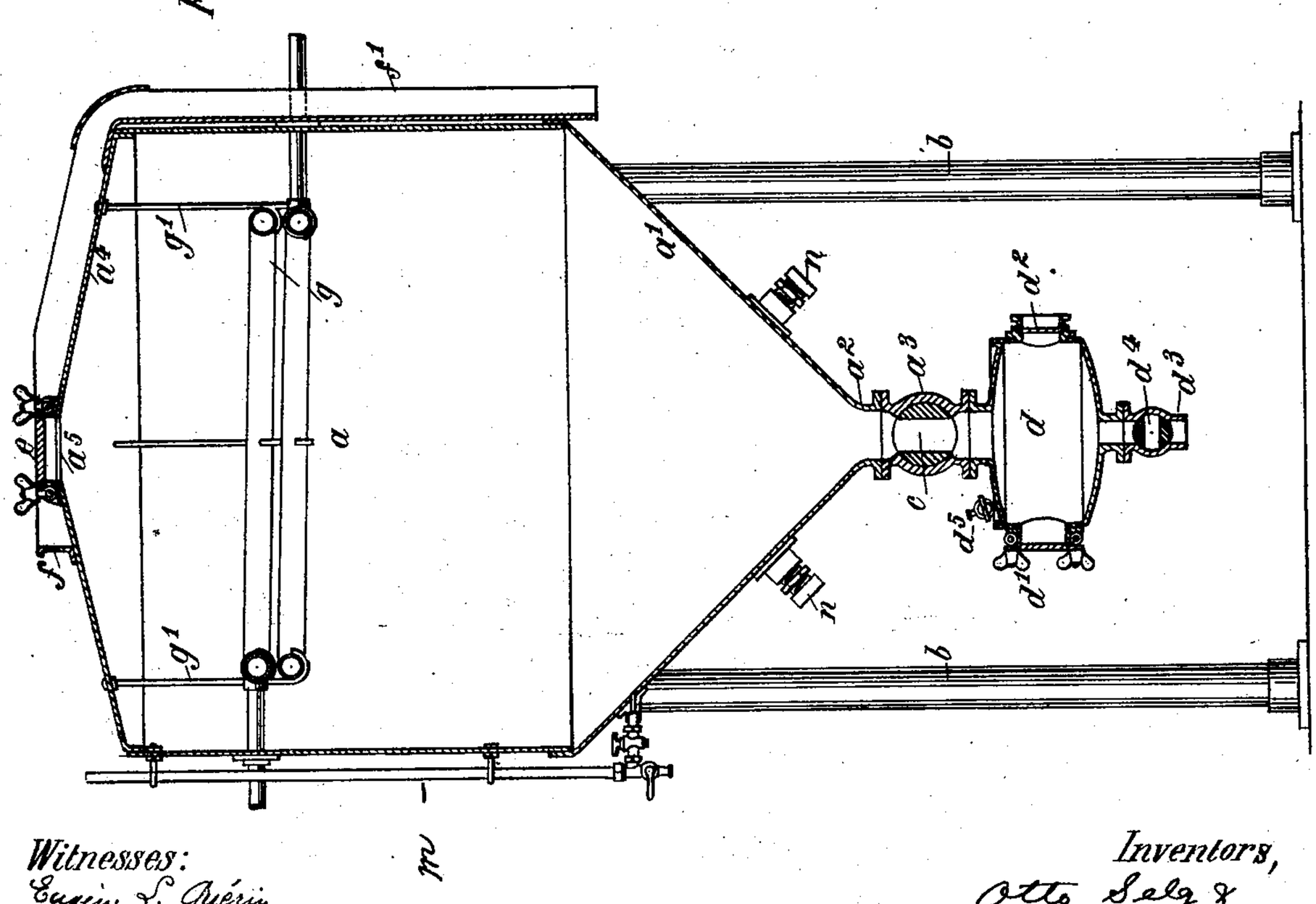


Fig. 3



Witnesses:
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Inventors,
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UNITED STATES PATENT OFFICE.

OTTO SELG AND CARL GUNTRUM, OF BROOKLYN, NEW YORK.

PROCESS OF CONVERTING WORT INTO BEER.

SPECIFICATION forming part of Letters Patent No. 694,584, dated March 4, 1902.

Application filed August 19, 1901. Serial No. 72,474. (No specimens.)

To all whom it may concern:

Be it known that we, OTTO SELG and CARL GUNTRUM, citizens of the United States, and residents of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Processes of Converting Wort into Beer, of which the following is a specification.

This invention relates to an improved continuous process for converting wort into beer or other fermented liquids by means of a single apparatus. Within this apparatus the wort is first fermented, and after the main body of the yeast has been withdrawn it is impregnated with carbonic-acid gas and simultaneously clarified. Thus the separate processes heretofore carried on in the fermenting-tub, the storage-tub, and the chip-cask are all combined and the latter two processes are carried on simultaneously.

An apparatus for carrying our process into effect forms the subject of a separate application for a patent filed by us August 19, 1901, under Serial No. 72,475.

In the accompanying drawing, Figure 1 is an elevation of said apparatus. Fig. 2 is an elevation at right angles to Fig. 1; Fig. 3, a vertical central section on line 3 3, Fig. 1, and Fig. 4 a plan with the upper cover removed.

The letter a represents a cylindrical tub having a smooth inner surface and supported by columns b. The bottom a' of the tub is sloped downward, being either conical or bulged, and merges at its center in a downwardly-extending curved neck a^2. This neck is provided with the casing a^3 of a full-way cock or gate-valve c and discharges at its lower end into a yeast chamber or pocket d. The pocket d has a manhole d', observation-glass d^2, a nipple d^3 with draw-off cock d^4, and a petcock d^5. The top a^4 of cylinder a rises from the periphery upward to the bung-hole a^5, which is adapted to be closed gas and water tight by a removable cover e. Around the bung-hole there is formed upon the upper slope of the cover a gallery f, that terminates in a gutter f', extending down along the side of cylinder a, the whole constituting a drip.

An attemperator g, composed, preferably, of a coil of pipe adapted to receive the cooling medium, is suspended within the upper part of cylinder a by means of hangers g'.

The apparatus is provided with a manhole h, proof-cock i, a vent k, a pressure-gage l, a stand-glass m, nipples n, a thermometer o, and test-glass p.

In practice the apparatus is mounted within a room of the brewery, the temperature of which is evenly maintained at about 41–43° Fahrenheit. It is charged with wort from the starting-tub or direct from cooler through one of the nipples n. The yeast is introduced either together with the wort from the starting-tub or it is separately introduced through the cover e, which is left open. The main fermentation will now set in and is allowed to continue from three to four days. If necessary, filtered air may be forced in through nipple d^3 to mix the yeast with the wort and accelerate the fermentation. During this fermentation the impurities will work up along the inner smooth surface of the cylinder and along the inclination of the cover, to be ejected through the bung-hole a^5. Arriving on the upper sloping side of the cover they are retained by the gallery f and conducted through gutter f' to a suitable dump. The carbonic-acid gas evolved during fermentation may be either allowed to escape together with the impurities or it may be collected as a by-product in a cylinder coupled to the vent k or bung-hole a^5. While the impurities work out, the main body of the yeast will descend along the tub a and inclined bottom a' to enter the chamber d through the neck a^2 and open cock c. This goes on during the entire duration of the main fermentation, upon the completion of which the cock c is closed, and the entrapped yeast is removed through cock d^4 without disturbing the beer. The yeast which has been withdrawn is ready for use upon a subsequent charge. After the removal of the main body of the yeast the cooling liquid is turned into the attemperator g, so as to cause a cooling of the upper strata of the beer. These upper strata in descending will displace the lower warmer strata to cause a thorough circulation and clarification of the entire body of the liquid. During this stage of the process the cover e is closed and the cock c reopened. Sufficient yeast and fer-

mentable matter should still be retained within the tub to cause, through after fermentation, the generation of a certain further quantity of carbonic-acid gas. This yeast, together with the albuminous substances, will be gradually conducted by the sloping bottom a' and curved neck a^2 into the chamber d and will be so completely separated that the beer will be thoroughly clarified. Thus the use of the chips is rendered unnecessary and any objectionable taste or smell in the product will be prevented. From the chamber d the carbonic-acid gas generated by the yeast, which has settled in the chamber from the tub a during the after fermentation, will rise briskly through the neck a^2 (similar to the action taking place in a champagne-glass) and will thus impregnate the beer, the escape of the gas being prevented by the tightly-fitting cover e. After the clarification and impregnation has continued for ten to twelve days the beer, now ready for the market, is filled into packages through nipples n. The sediments settling in chamber d are thrown away.

It will be seen that by our improved process we dispense with the use of separate fermenting-tubs, storage-tubs, and chip-casks and are enabled to carry on all the steps necessary for converting wort into beer within a single apparatus. In this way a large saving of floor-space is effected and a consequent large saving in refrigeration heretofore necessary for reducing the temperature of the entire plant. Further, the handling of the beer is reduced to a minimum, time is saved, the entire process can be watched through the stand-glass m and observation-glass d^2, and a superior product is obtained. The yeast is not contaminated, and its removal is simplified. The entire apparatus by which the process is carried out may be contained in a one-story building, because the continuous filling of tanks from floor to floor is entirely obviated.

What we claim is—

The process of converting wort into beer, which consists in first adding yeast to the wort in a tub provided with an upper opening, to effect a main fermentation and a simultaneous ejection of impurities, then separating the main body of the yeast at the bottom of the liquid, leaving a residue of yeast in the tub, then closing the tub and subjecting the liquid to after fermentation by such residue of the yeast, and simultaneously cooling the upper strata of the liquid, substantially as described.

Signed by us at New York city, county and State of New York, this 14th day of August, 1901.

OTTO SELG.
CARL GUNTRUM.

Witnesses:
F. v. BRIESEN,
THOMAS J. CARELLA.