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PATENTED JUNE 4, 1907.

W. GRIESSER.
TRIPLE PIPE BEER COOLER.
APPLICATION FILED FEB. 19, 1906.

3 SHEETS—SHEET 1.

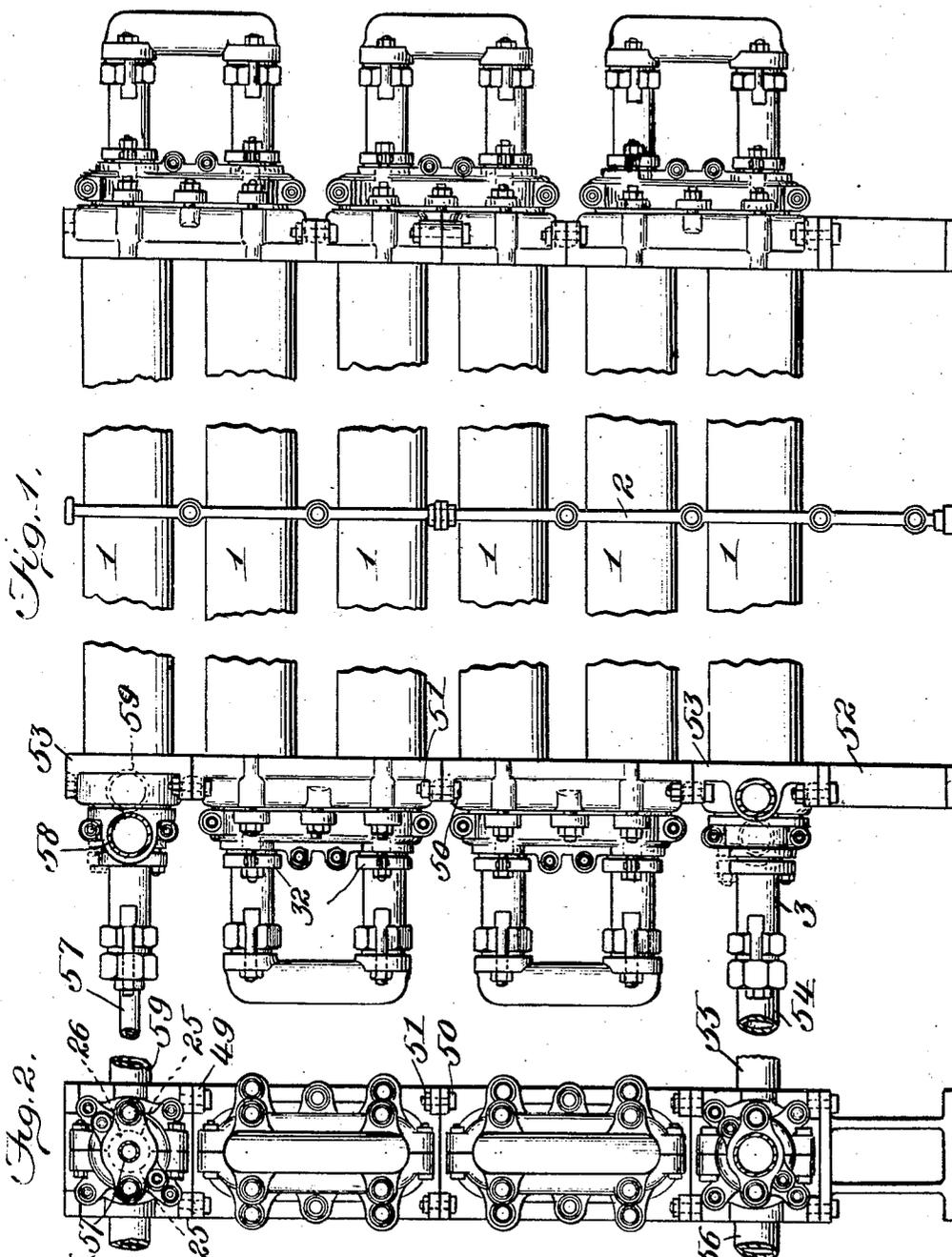


Fig. 1.

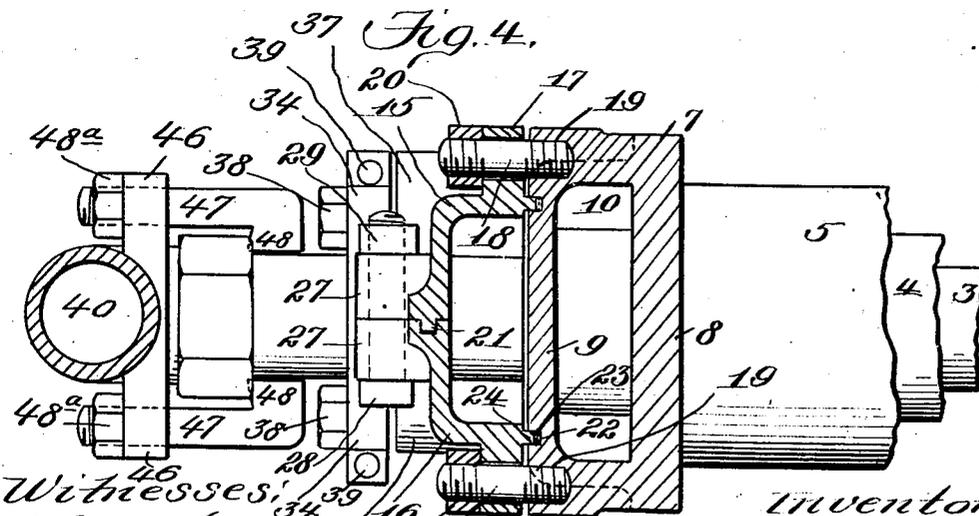
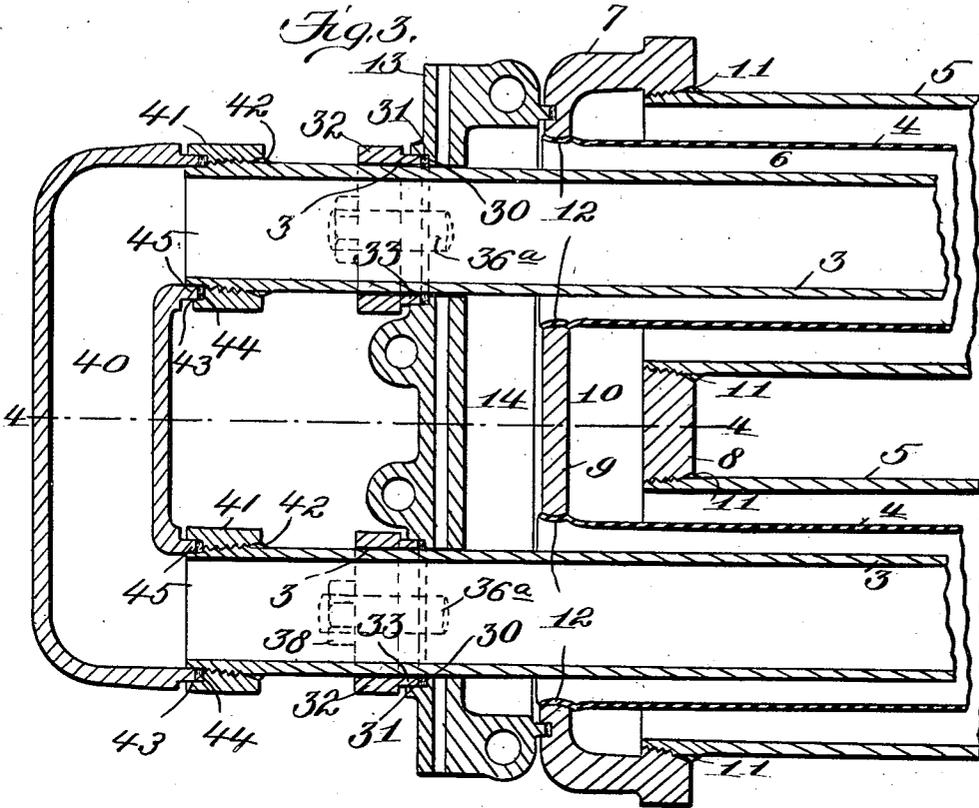
Fig. 2.

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Fig. 5.

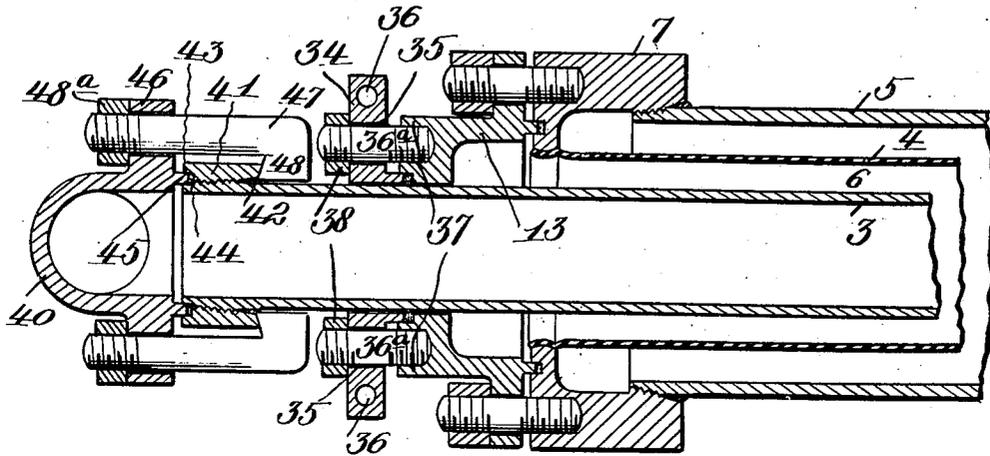
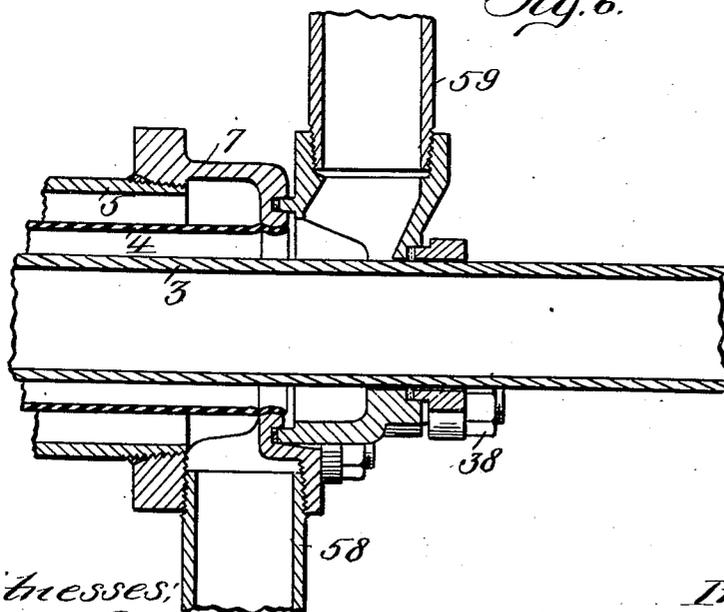


Fig. 6.



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UNITED STATES PATENT OFFICE.

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TRIPLE-PIPE BEER-COOLER.

No. 856,140.

Specification of Letters Patent.

Patented June 4, 1907.

Application filed February 19, 1906. Serial No. 301,887.

To all whom it may concern:

Be it known that I, WILHELM GRIESSER, a citizen of the United States, residing at Joplin, in the county of Jasper and State of Missouri, have invented new and useful Improvements in Triple-Pipe Beer-Coolers, of which the following is a specification.

This invention relates to triple pipe beer coolers adapted to permit a continuous circulation in separate pipes, respectively, of beer, brine and ammonia, the various pipes being arranged and connected at their ends to form a continuous coil, having an inlet at one end and an outlet at the other.

The invention relates more particularly to an improvement in the construction of the heads or bends connecting in alternate relation the opposite ends of the pipes of the coil.

In order that the said invention may be clearly understood I have illustrated the same in the accompanying drawings, in which:

Figure 1 is a side elevation of my improved triple pipe beer cooler; Fig. 2 is an end elevation; Fig. 3 is a vertical section on an enlarged scale of one of the heads; Fig. 4 is a section upon the line 4—4 of Fig. 3; Fig. 5 is a vertical section on an enlarged scale through a single pipe-unit and head at the inlet or outlet end of the apparatus; and Fig. 6 is a horizontal section of the same.

Referring now to these drawings, the numerals 1 indicate a series of pipe-units arranged in parallel relation one above the other and supported at their ends in a manner to be described later on, and at a central portion by means of a frame 2. Each of the pipe-units 1 comprises an inner pipe 3 for ammonia, an intermediate pipe 4, for beer, and an outer pipe 5, for brine. These pipes are concentrically arranged in spaced relation, and, as will be seen, the beer will circulate in the space 6 between the pipes 3 and 4 and will thus travel in a thin sheet, as it were, between the ammonia and the brine. The pipes of each unit are connected at opposite ends with the corresponding pipes of adjacent units in a manner to afford a continuous circulation of the different liquids employed throughout the entire series of pipes, and as all of these connections are the same, the description of one will suffice.

Referring now to Fig. 3, 7 indicates a hol-

low head or casting having two parallel walls, namely, a rear wall 8 and a front wall 9, affording between them a chamber 10. The rear wall 8 is provided, toward its outer ends, with two screw-threaded apertures into which are screwed the outer ends of the pipes 5 of two adjacent units. These joints are made perfectly tight through the medium of solder 11. The pipes 5 are about five inches in diameter, in actual practice, and are intended for the circulation of brine. The intermediate pipes 4 of the two units, connected by the head 7, are shown to project beyond the outer ends of the pipes 5, and their outer ends are rolled and expanded, as indicated at 12, to be firmly secured in apertures formed in the front wall 9 of the head 7. These pipes 4 are of copper and are intended for circulation of beer. 13 indicates a sectional cap which is applied to the front face of the head 7, the sections being recessed on their inner sides to form, when applied to the head 7, a chamber 14 to provide for the circulation of the beer from one pipe 4 to the next adjacent pipe 4. The two sections of the cap 13 are indicated, respectively, by the numerals 15 and 16 and each of these sections has at its outer edge three or more apertured lugs 17 by means of which they are secured to the front of the head 7. This is accomplished through the medium of bolts 18 which have a central plain portion adapted to seat in the apertures of the lugs 17 and opposite screw-threaded ends, one of which is screwed into screw-threaded apertures of projections 19 on the front of the head 7 and the other of which receives nuts 20 which bear against the lugs 17. The two sections 15 and 16 are divided vertically with respect to the position of the apparatus shown and at their meeting edges have a tongue and groove connection 21, which connection will be further re-inforced by packing, as will be understood. The outer wall 9 of the head 7 is provided with a continuous groove 22 into which is inserted metal or other packing 23, and each of the sections of the cap 13 is provided on its inner side with a tongue 24 which is adapted to seat in the groove 22 and to be firmly pressed against the packing 23 by screwing up the nuts 20. Each of the sections 15 and 16 is provided with semi-circular recesses 25 which, when said sections

are placed together, form apertures 26 through which the innermost pipes 3 project. Each of said sections 15 and 16 is also provided on its outer side, above and below each of the semi-circular recesses 25 therein, with lugs 27 which are adapted to align. Bolts 28 are passed through these aligning apertures and have nuts 29 applied to their ends for securing the two halves of the cap together. The pipes 3, as above stated, extend through the sectional cap 13, which cap is provided in its outer face with recessed seats 30 surrounding the apertures 26 and into which seats are inserted annular packing rings 31 which closely embrace the pipes 3 and are firmly compressed into position by means of split sleeves 32 affording an annular flange 33 which enters the seat 30 and engages the packing 31. Each of the sections of the sleeve 32 is provided with a projecting lug 34 in each of which is formed a semi-circular recess 35 and a bolt-hole 36. When the two sections of the sleeves 32 are placed together about the pipes 3 the semi-circular recesses 35 form apertures for bolts 36^a, which have plain portions seating in such apertures and opposite screw-threaded ends, one of which is screwed into screw-threaded apertures formed in lugs 37 provided on the front face of the cap 13, and the other of which receives nuts 38 by means of which the sleeve may be drawn into firm contact with the packing 31 in the seat 30. Bolts 39, inserted through the bolt-holes 36 of the lugs 34, secure the two sections of the sleeve 32 together and firmly clamp them about the pipes 3.

The outer ends of the pipes 3 are united by means of a return-bend 40 which permits circulation of the ammonia from one pipe 3 to the next adjacent pipe and this connection is made as follows: The outer end portion of each of the pipes 3 is screw-threaded and on these screw-threaded portions are screwed collars 41, the joint being made gas-tight at the rear sides of the collars by means of solder 42. The outer ends of the pipes 3 and the corresponding outer end portion of the collars 41 are recessed to provide annular seats 43 into which seats are inserted metal packing 44. At opposite ends of the return-bend 40 the opening therein is surrounded by an annular flange 45, which flanges are adapted to be inserted in the seat 43 in contact with the metal packing 44. The return-bend 40 is provided on opposite sides and near each end with apertured lugs 46, through the apertures in which are passed screw-threaded ends of bolts 47 having hooked ends 48 engaging the rear sides of the respective collars 41. By means of nuts 48^a applied to the screw-threaded ends of the bolts 47 the return-bend 40 is drawn into firm contact with the ends of the pipes 3 and with the packing 44 surrounding said pipes. The con-

nection between the pipes 3 and the return-bend 40 comprising the collars 41, firmly secured on the ends of said pipes, is a very secure one and this is an important consideration as the pipes 3 are for the circulation of ammonia, and it is necessary to prevent the possibility of the escape of ammonia around the screw-threads of the pipes, which is accomplished by the solder 42, and at the connections between said pipes and the return-bend, which is accomplished by the packing 44 and the manner of firmly drawing the flanges of the return-bend into contact with the said packing and the outer ends of the pipes 3. Owing to the firm and gas-tight connection of the collars 41 with the pipes 3 it is not desirable to remove these collars at any time, and hence the construction described has in view to permit the pipes to be removed from the apparatus without it being necessary to remove the collars 41. For this purpose the cap 13 and the sleeves 32 are made in sections. By removing the nuts from the bolts, by means of which these parts are connected to the head 7 and to each other, the sections of the cap 13 and sleeves 32 may be removed from about the pipes 3, and in a similar manner the return-bends 4 may be withdrawn from the ends of said pipes in order that they may be readily drawn through the pipe 4 to permit the latter to be cleaned. Each of the heads 7 is provided on its front face, at each corner, with apertured lugs 49 so that when said heads are placed one upon the other they may be united by means of bolts 50 passed through said apertures and having nuts 51 applied thereto, the heads, when so united, forming a stand or support for readily holding the pipe-units of the apparatus in position at their outer ends. The lowermost head 7 at one end of the apparatus and the head 53 at the other have secured to them standards or bases 52 which rest upon the floor and support the apparatus as a whole in connection with frame 2. The heads 53 at the respective ends of the coil are the same in construction as those just described, except that it is only necessary that they should provide for a single pipe-unit instead of for two pipe-units. The pipe 3 of the lowermost unit 1 is suitably connected to a suction-pipe or ammonia outlet 54 while the head 53 of said unit is provided with a brine-outlet pipe 55 and the cap 13 with a beer inlet 56. The upper unit 1 has a pipe 3 connected with an ammonia supply pipe 57 while its cap 13 is provided with a beer outlet 58 and its head 53 with a brine inlet 59.

While I have described a cooling apparatus intended more particularly for use in cooling beer, it will be apparent nevertheless that a series of pipes connected up as described can be utilized for heating purposes as well as for cooling; for instance, steam could be

passed through the intermediate pipes for the purpose of heating the water passing through the inner and outer pipes.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a beer cooling apparatus, in combination with a series of pipe-units each of which comprises a plurality of pipes concentrically arranged one within the other in spaced relation, a series of hollow heads, each of said heads having the ends of two adjacent outermost pipes secured in its near wall and the ends of two adjacent intermediate pipes secured in its far wall, sectional caps secured to each of said heads and affording communication between the intermediate pipes thereof, the innermost pipes of two adjacent units continuing through and being supported by said caps, collars secured on the outer ends of the innermost pipes and of a diameter less than said intermediate pipes, and return-bends connecting the ends of adjacent innermost pipes and cooperating with said collars to form gas-tight joints.

2. In a beer cooling apparatus, in combination with a series of pipe-units each of which comprises a plurality of pipes concentrically arranged one within the other in spaced relation, a series of hollow heads, each of said heads having the ends of two adjacent outermost pipes secured in its near wall and the ends of two adjacent intermediate pipes secured in its far wall, sectional caps secured to each of said heads and affording communication between the intermediate pipes thereof, the innermost pipes of two adjacent units continuing through and being supported by said caps, collars secured on the outer ends of the innermost pipes and of a diameter less than said intermediate pipes, return-bends connecting the ends of adjacent innermost pipes and provided with apertured lugs, and bolts having hooked ends engaging said collars and screw-threaded ends passed through the apertures in said lugs and having nuts applied thereto.

3. In a beer cooling apparatus, in combination with a series of pipe-units each of which comprises a plurality of pipes concentrically arranged one within the other in spaced relation, a series of hollow heads, each of said heads having the ends of two adjacent outermost pipes secured in its near wall and the ends of two adjacent intermediate pipes secured in its far wall, sectional caps secured to said heads and affording communication between said intermediate pipes, each of said caps having two innermost pipes continuing therethrough and affording annular seats surrounding said pipes, split sleeves surrounding each of said innermost pipes and having adjustable connection with said caps and provided with annular tongues engaging in said seats, collars secured on the ends of said innermost pipes, each of said collars being of a diameter to pass through said intermediate pipes, and return-bends removably secured to the ends of adjacent innermost pipes and cooperating with said collars to form gas-tight joints.

4. In a beer cooling apparatus, in combination with a series of pipe-units each of which comprises a plurality of pipes concentrically arranged one within the other in spaced relation, a series of hollow heads, each of said heads having the ends of two adjacent outermost pipes secured in its near wall and the ends of two adjacent intermediate pipes secured in its far wall, sectional caps secured to said heads and affording communication between said intermediate pipes, each of said caps having two innermost pipes continuing therethrough and affording annular seats surrounding said pipes, split sleeves surrounding each of said innermost pipes and having adjustable connection with said caps and provided with annular tongues engaging in said seats, collars secured on the ends of said innermost pipes, each of said collars being of a diameter to pass through said intermediate pipes, and return-bends removably secured to the ends of adjacent innermost pipes and cooperating with said collars to form gas-tight joints.

4. In a beer cooling apparatus, in combination with a series of pipe-units each of which comprises a plurality of pipes concentrically arranged one within the other in spaced relation, a series of hollow heads each of said heads having the ends of the outermost pipes of two adjacent units secured in its near wall and the intermediate pipes of such units secured in its far wall, said head having a grooved seat provided on its outer face, sectional caps secured to said heads and having tongues engaging in said seats, means for connecting the meeting edges of each cap together involving a tongue-and-groove joint, each of said caps providing a chamber affording communication between adjacent intermediate pipes and having the innermost pipes of adjacent units continuing therethrough, split sleeves surrounding said innermost pipes and secured to said caps, and return-bends removably secured to the outer ends of adjacent innermost pipes.

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

WILHELM GRIESSER.

Witnesses:

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CHAS. W. GRIESSER.