

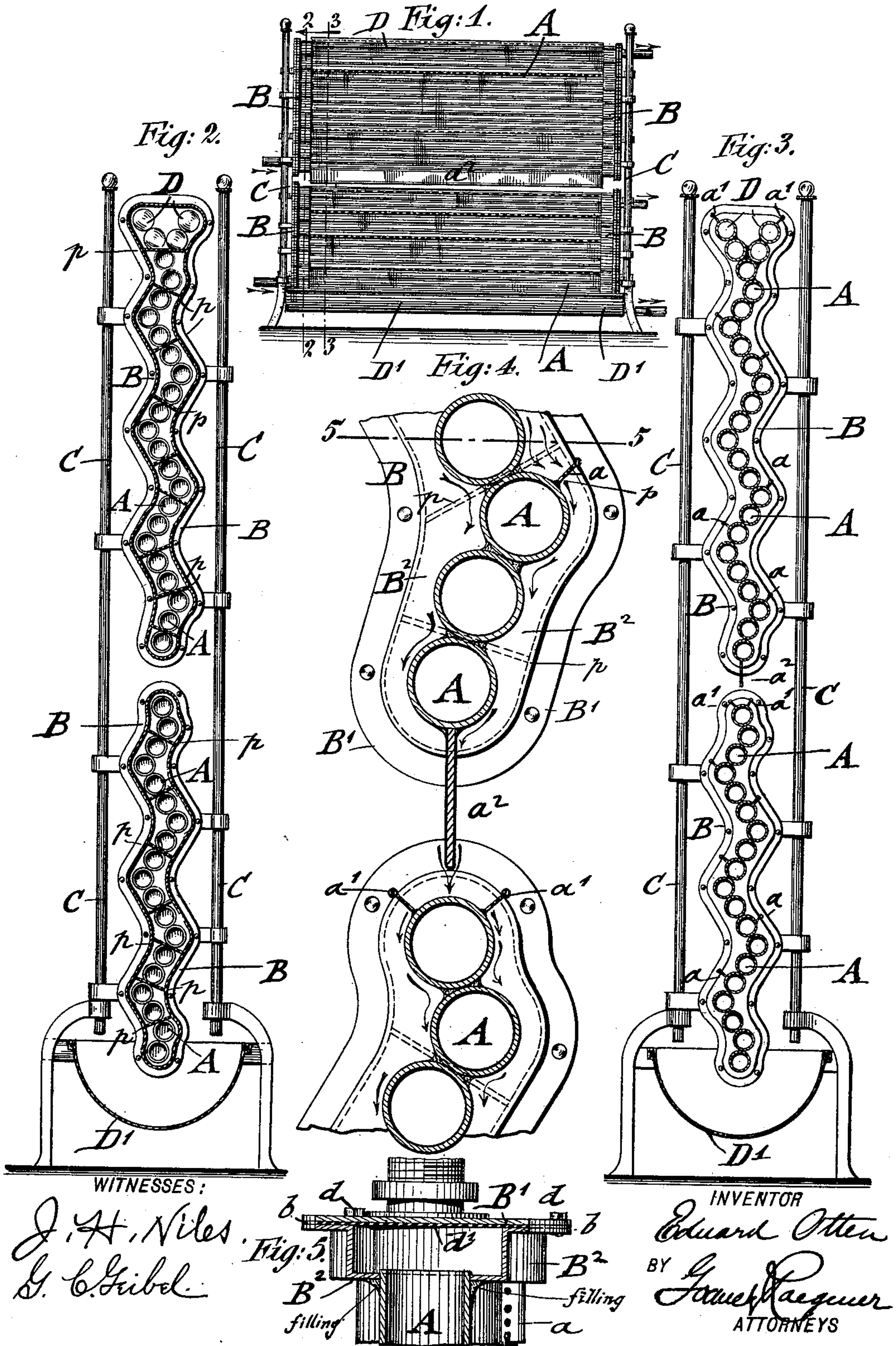
No. 675,790.

Patented June 4, 1901.

E. OTTEN.
BEER COOLER.

(Application filed Aug. 2, 1900.)

(No Model.)



UNITED STATES PATENT OFFICE.

EDUARD OTTEN, OF NEW YORK, N. Y.

BEER-COOLER.

SPECIFICATION forming part of Letters Patent No. 675,790, dated June 4, 1901.

Application filed August 2, 1900. Serial No. 25,631. (No model.)

To all whom it may concern:

Be it known that I, EDUARD OTTEN, a citizen of the Empire of Germany, residing at New York, in the borough of Manhattan and State of New York, have invented certain new and useful Improvements in Beer-Coolers, of which the following is a specification.

This invention relates to an improved beer-cooler of that class in which the flow of cooling medium is in a direction opposite to the flow of the wort-beer or other liquid to be cooled, the cooler being made in such a manner that an increased cooling-surface is obtained for the wort and that the expensive connection of the cooling-pipes at their ends by means of bends is dispensed with and a cheaper and simpler construction substituted for the same; and the invention consists of a beer-cooler which comprises a series of parallel cooling-tubes arranged in a zigzag line closely to each other and connected by metallic filling-joints at their points of contact, the ends of the cooling-pipes being supported by upright casings provided with alternating partitions between the pipes, so that a circuitous flow of the cooling-liquid through the entire system of pipes is obtained. The connection of the cooling-pipes with the outer surface of the supporting-casings is made by means of metallic filling-joints to fill up the angles between the faces of the casings and the cooling-pipes.

The invention consists, further, of the combination, with a series of cooling-pipes and partitions for supporting the same, of a trough at the upper end of the cooling-pipes, said trough being provided with openings for overflow of the wort, intermediate deflecting flanges, and a receiving-trough below the lower wort-pipe of the system of cooling-pipes, from which the cooled wort is conducted off.

In the accompanying drawings, Figure 1 is a side elevation of my improved beer-cooler. Fig. 2 is a vertical transverse section on line 2 2, Fig. 1, through one end casing of the same. Fig. 3 is a vertical transverse section on line 3 3, Fig. 1, through the upper and lower sections of the cooler. Fig. 4 is a vertical transverse section of the adjacent sections of the cooler, drawn on a larger scale; and Fig. 5 is a detail horizontal section on line 5 5, Fig. 4.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A A' represent two sets of parallel cooling-pipes, which pipes are preferably made of copper and which are arranged in a zigzag line, one below the other. The pipes A A' are placed in contact with each other and connected by means of metallic filling-joints, formed of tin run into the angles between the pipes and then wiped off concavely, so that the wort or other liquid to be cooled runs freely in a continuous film over the outer surface of the cooling-pipes from the upper toward the lower end. It is preferable to use pure metallic tin for the connection between the pipes. Some of the pipes are provided with projecting flanges *a*, at suitable distances from each other, so as to form an obstruction to the film of wort that passes over the cooling-pipes, so that the same is deflected and then returned again to the surfaces of the pipes below the flanges. The said flanges *a* are each provided with a longitudinal series of perforations *p*, which serves to allow the wort to flow in even small streams therethrough, so as to be equally distributed across the cooler, and whereby a film of even thickness throughout is formed, so that the same will be evenly and similarly cooled. The zigzag arrangement of the pipes is for the purpose of increasing the cooling-surface.

The ends of the cooling-pipes are supported by casings B B, which are made of brass or other suitable material and which are provided with openings arranged also in zigzag fashion, so that the ends of the cooling-pipes can be readily inserted into the casings and soldered to the same by means of block-tin, which fills up the angles between the faces of the casings and the cooling-pipes at the point of entrance into the casing, as shown in Fig. 5. The metallic filling-joints are concaved, so that the wort flows readily over them and forms no angles for the lodgment of sediment at the points of connection of the cooling-pipes with the casings. The casings B are made of an end wall B' and a box B² of U-shaped cross-section, having flanges *b* at opposite sides, which are attached to the end wall B' by bolts *d*. A packing-layer of sheet-tin *d'* is interposed between the end wall B' and the

box B². The general contour of the casings B follows the zigzag line of the cooling-pipes, as shown in Fig. 3. In each casing are arranged transverse partitions *p*, preferably of copper, the partitions of one casing alternating with the partitions of the opposite casing, so that the cooling medium is conducted through the lowermost cooling-pipe into the casing at one side, then through the second cooling-pipe to the opposite casing, where it is conducted into the third pipe back to the casing, and so on through all the cooling-pipes. The alternating partitions in the casings B B take the place of the semicircular bends by which heretofore the opposite ends of the cooling-pipes were connected and form thereby a much simpler connection, by means of which the cooler can be more conveniently assembled when set up.

The casings B are supported by upright pillars C, which are connected by clips with the flanges *b* of the casings, as shown in Figs. 2 and 3. The pillars C are supported at their lower ends by feet C', which rest on the floor. The pillars are preferably made of cast-iron and of sufficient height so as to permit the arrangement of several sets or systems of cooling-pipes, one below the other, the lower being preferably cooled by ammonia or other cooling medium, while the upper system of cooling-pipes is cooled by ordinary well-water, that is pumped in the usual manner through the pipes.

At the upper end of each system of cooling-pipes is preferably arranged a trough D, into which the wort is conducted, said trough being formed of parallel pipes and perforated flanges *a'*, so that the wort flows over at both sides of the trough and then over the surfaces of all the cooling-pipes, its course being only interrupted from time to time by the projecting flanges *a*, by which the film of wort is broken up to some extent and then passed again over the surfaces of the cooling-pipes next below said flanges. When the wort arrives at the lower end of the lowermost pipe of the upper system, it is conducted along a vertical center flange *a*², Fig. 3, onto a trough on the upper pipe of the next system of cooling-pipes, also formed of perforated flanges *a'*, then over the lower system of cooling-pipes, from which it is finally conducted into a bottom trough D', from which the cooled wort is conducted off to the fermenting-casks in the usual manner.

The advantages of my improved beer-cooler are:

First. The wort is passed in a continuous and unbroken film over the surfaces of the cooling-pipes without being acted on by the air in the same manner as in the beer-coolers heretofore in use, in which the pipes are provided with serrated flanges at their lower part, over which the wort trickles onto the next cooling-pipe below. As the air, especially in the summer, is often warmer than

the wort, the action of air on the wort does not keep up a continuous cooling action on the wort, which is the main object of my cooler.

Second. Another advantage is that the wort is not scattered when passing from one pipe to the other, but runs in a continuous film over the pipes, while the flanges on the same merely serve for the purpose of breaking up the film, so as to change the relative location of its particles when continuing its course over the remaining surfaces of the cooling-pipes.

Third. The cooler can be readily assembled, as no screwing together of the parts is necessary, the tin connection between the cooling-pipes, as well as with the inner faces of the casings, being readily accomplished by any one who has some experience in wipe-joints, so that the cooler can be shipped in detached condition and readily set up at the place of use by any plumber in connection with instructions sent on.

Fourth. The cooler can be made at a much lower price than the counter-current beer-coolers heretofore in use, for the reason that the individual connection between the cooling-pipes is dispensed with and replaced by the simpler connection of the casings with the cooling-pipes.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with a series of cooling-pipes arranged in a zigzag line, one below the other, of casings at the ends of said pipes, provided with transverse partitions for connecting alternately the ends of the cooling-pipes, a receiving-trough above the uppermost cooling-pipe, having perforated flanges, a central drip-flange at the lower end of the lowermost pipe of the upper section of cooling-pipes, and a trough below the lower end of the lower section of cooling-pipes, substantially as set forth.

2. The combination, with a series of cooling-pipes arranged in a zigzag line, one below the other, provided with exterior perforated deflecting-flanges arranged at intervals thereon, of casings at the ends of said pipes, provided with transverse partitions for connecting alternately the ends of the cooling-pipes, a receiving-trough above the uppermost cooling-pipe, having perforated flanges, a central drip-flange at the lower end of the lowermost pipe of the upper section of cooling-pipes, and a trough below the lower end of the lower section of cooling-pipes, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

EDUARD OTTEN.

Witnesses:

PAUL GOEPEL,
J. H. NILES.