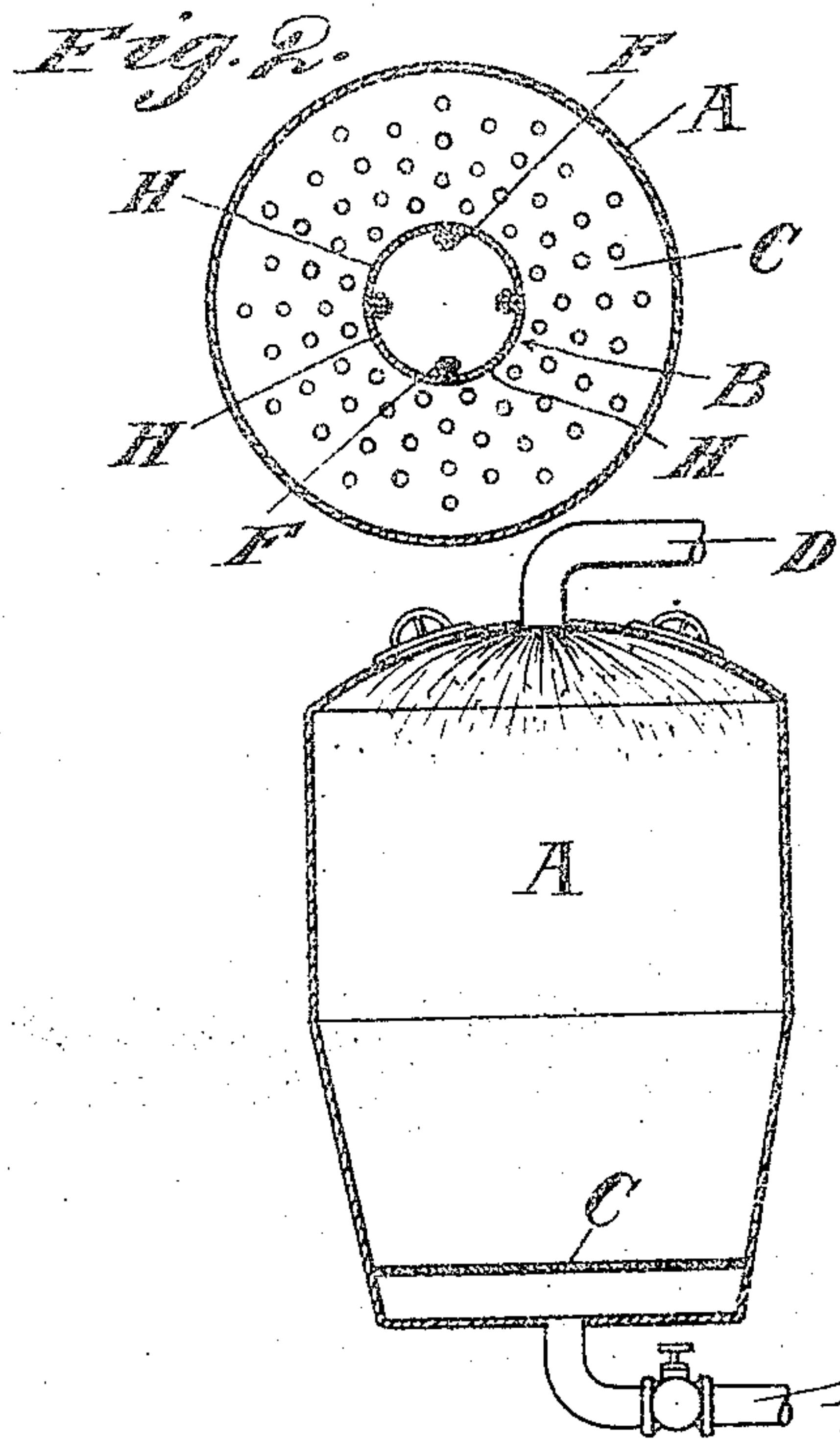
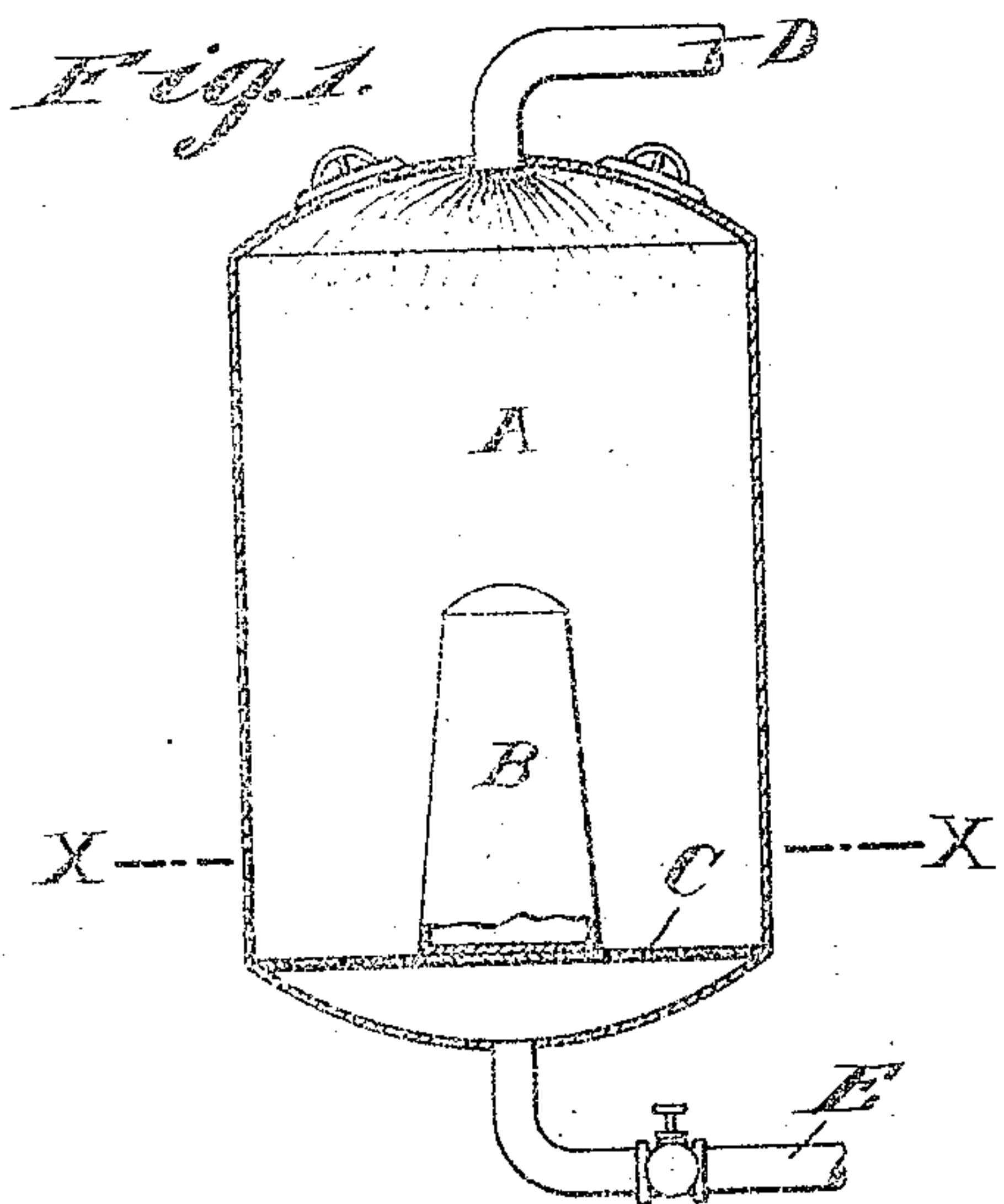


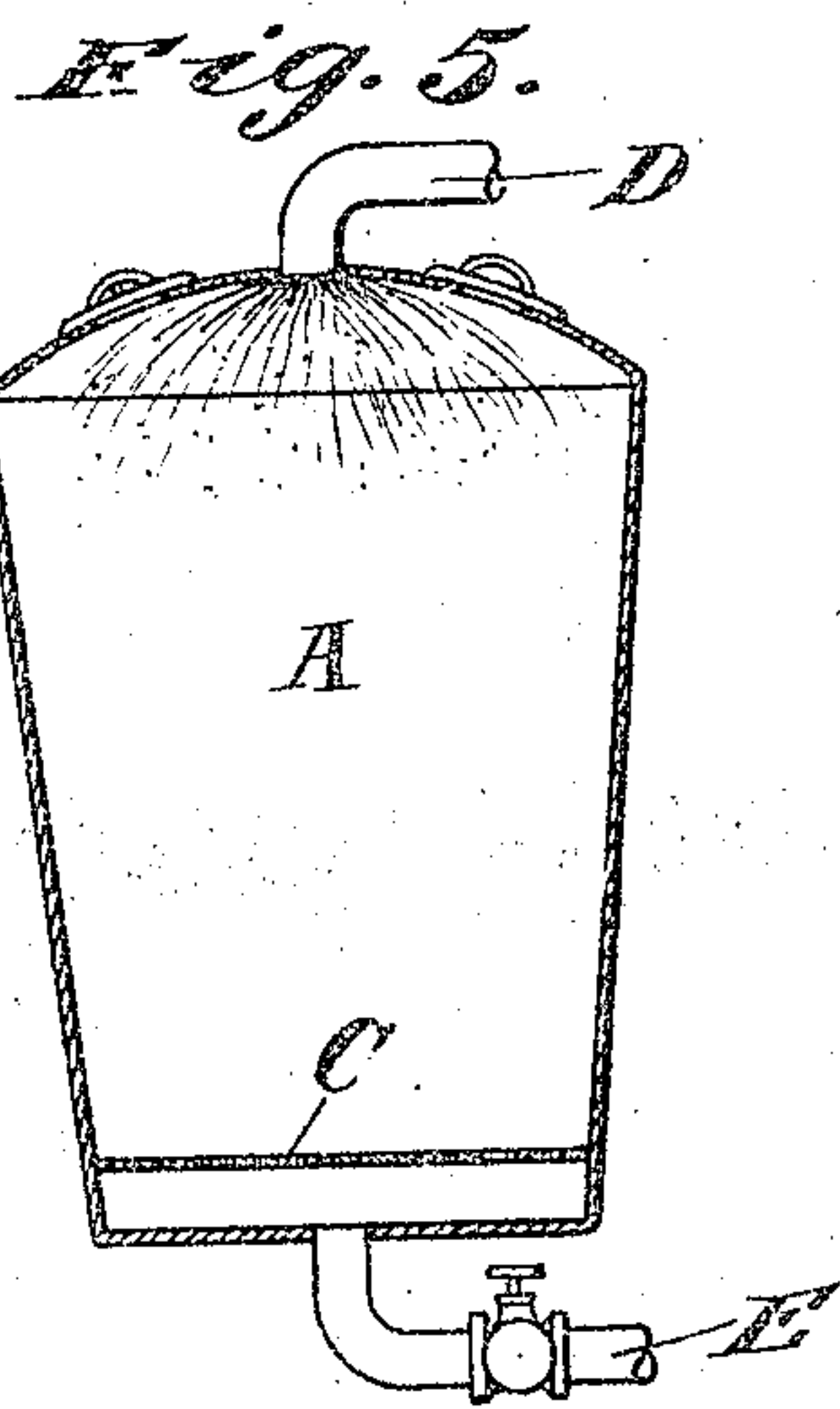
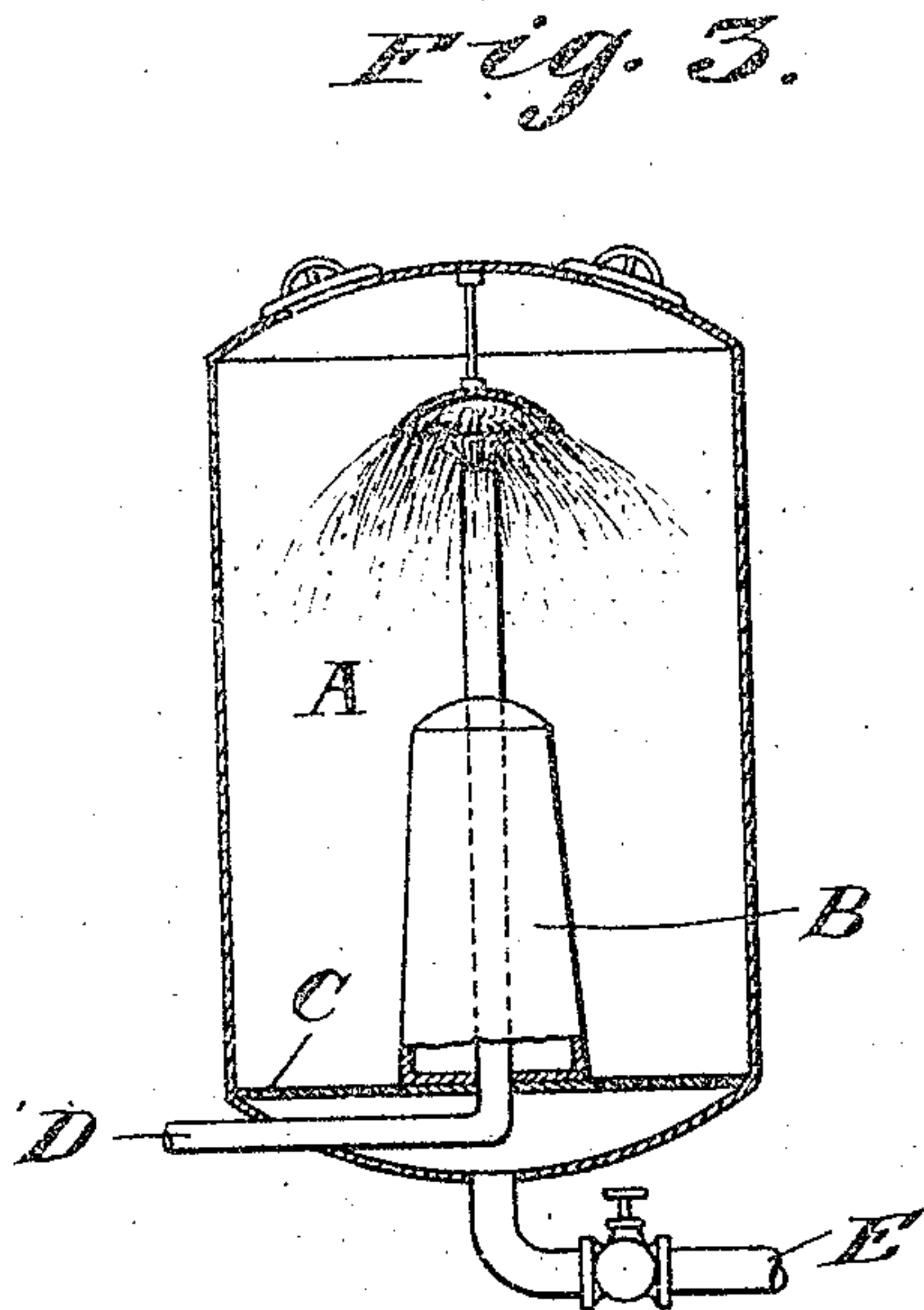
J. HIRSCHBERGER.  
 APPARATUS FOR THE TREATMENT OF TEXTILE FIBERS WITH LIQUIDS.  
 APPLICATION FILED DEC. 10, 1910.

1,154,631.

Patented Sept. 28, 1915.



*Fig. 4.*



Witnesses:  
*Wm. C. Dunn*  
*Wm. C. Dunn*

Inventor  
*Josef Hirschberger*  
 By *Byliss Attorney*  
*Howard Freeman*



# UNITED STATES PATENT OFFICE.

JOSEF HIRSCHBERGER, OF JERSEY CITY, NEW JERSEY.

APPARATUS FOR THE TREATMENT OF TEXTILE FIBERS WITH LIQUIDS.

1,154,631.

Specification of Letters Patent.

Patented Sept. 28, 1915.

Application filed December 10, 1910. Serial No. 596,615.

*To all whom it may concern:*

Be it known that I, JOSEF HIRSCHBERGER, doctor of philosophy, a subject of the Emperor of Germany, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Apparatus for the Treatment of Textile Fibers with Liquids, of which the following is a full, clear, and exact specification.

My invention relates to an apparatus for the treatment of textile fibers with liquid and capable of producing perfect, uniform, and complete penetration.

In the treatment of textile fabrics with liquids, it is sometimes necessary to place them in tanks, vats, or keirs containing porous false bottoms, consisting of stones or perforated metal, the liquid being supplied at the top of the vessel and drawn off from beneath the false bottom. During the process of introducing the fabrics into the vat, it is impossible to prevent the formation of openings through which the liquid passes more freely than through other portions of the contents of the vat, and as a result the lower portions of the textile fabrics are subjected to a smaller quantity of the liquid than the upper portions, and this difficulty is further aggravated on account of the fact that in many cases, as in the bowking process, the liquid acts upon the fabrics, reducing its resistance to the liquid and causing said liquid to pass subsequently more freely through such fabrics than through that portion not acted upon, or not so completely acted upon.

In bowking and bleaching textile fabrics in the ordinary way, the fabric passes through the different processes in the form of one long rope. In order to handle this economically it is essential that it be introduced into and removed from the bowking keir with great rapidity by means of machinery. The fabric is run into the keir and a man within the keir lays and arranges it. This must be done very rapidly and he has little time for a careful arrangement of the fabric. For this reason the bowking keir must be of such a form that a uniform penetration of the fabric will be caused even in those portions of the keir which are not laid very regularly. The fabric after bowking is removed very rapidly by machinery, usu-

ally about 180 yards per minute, and if the goods are tangled or misplaced to any extent the removal is suddenly interrupted, resulting in delay in removal, injury to the fabric and breaking of the removing machinery. It is imperative therefore in a successful bowking keir that the keir be one in which there is no danger of entanglement of the fabric during the process of treatment with the bowking liquid. Attempts to force the bowking liquid upwardly through the fabric have proved commercially unsuccessful as all of the known processes of thus forcing the liquid upwardly have caused an entanglement of the fabric rope, resulting in the difficulties and inconveniences above mentioned. My bowking keir overcomes all of these difficulties because, on account of its shape and the fact that the bowking liquid is allowed to flow downwardly through the fabric, perfect and complete penetration of the fabric is caused, and the fabric is allowed to remain in its original position free from entanglement and hence capable of the necessary rapid removal from the keir by machinery.

I have discovered that the above serious faults can be overcome and obviated and the operation can be performed more quickly and cheaply by reducing the area of a portion of the lower part of the vessel, and causing the liquid to pass through a smaller area in that portion of the vessel than in the upper portion, thus producing a uniform flushing of the fabrics in both the upper and lower portions of the vat. It is evident that this result can be accomplished in a number of ways and I herewith describe one method by which the ordinary vats or keirs now used in the regular bowking treatment of cotton and linen fabrics can be converted into a form of apparatus suitable for my process.

In the drawings accompanying and forming a part of this specification, Figure 1 is a vertical section of one form of apparatus suitable for the employment of my process; Fig. 2 being a cross-section through the line X—X of Fig. 1. Fig. 3 is a vertical section of an apparatus applying my process to the so-called "clearing boiler". Figs. 4 and 5 are other forms of apparatus suitable for the application of my bleaching process.

A is an ordinary injector keir, although it



is immaterial for my process whether it be open for the open treatment, or closed for the pressure or vacuum treatment.

C is the porous false bottom of perforated metal.

D is the feeding pipe for the liquid, and E the exit pipe through which the liquid is drawn off after having passed through the fabrics. In order to overcome the uneven treatment of the fabrics in this form of keir, I introduce the closed receptacle B in the center of the keir and resting upon the porous false bottom. In this particular apparatus the closed receptacle is composed of four angled circular segments H, bolted together by the bolts F, the angles and bolts being within the receptacle to prevent their interference with the fabrics. The introduction of this closed receptacle reduces the area of the false bottom and of the lower portion of the keir, and as a result the liquid filling the upper portion of the keir is compelled to pass through a smaller area in the lower portion, in which portion the unevenly-treated fabrics are found. As the liquid is thus compelled to pass through a reduced quantity of fabrics, it penetrates them completely, causing a perfect and uniform penetration thereof.

Fig. 3 is a vertical section of an apparatus showing the method of applying my process to the so-called "clearing boiler" in which the liquid is forced up through the center of the boiler, the feeding pipe D, being passed through the closed receptacle B, and attached thereto in such a manner that the liquid in the vessel cannot enter the closed receptacle.

Without limiting myself to the particular size of the closed receptacle, I have found that good results can be produced by employing a closed receptacle having a diameter in the upper portion about one-fourth of the diameter of the bottom of the vat, a diameter in the lower portion about one-third of the bottom of the vat, and a height about one-half the height of the vat above the false bottom.

As it is evident that the size, shape, and position of the closed receptacle may be varied without going beyond the scope of my invention, I do not limit myself to the particular size, shape, and position given above. The closed receptacle may be of any material that is not affected by the liquid and

does not affect the fabrics upon which the operation is performed.

As the essence of my invention is an apparatus capable of producing complete and perfect penetration of textile fabrics, it is evident that the same result can be obtained by employing apparatus such as is represented in Figs. 4 and 5 of the drawings, showing vertical sections of vats or keirs, in which the containing-walls of the liquid-containing-vat or keir, instead of being perpendicular, are partially or wholly of a cone shape, thus causing the liquid to pass through a smaller quantity of textile fabrics in the lower portion of the vat or keir than in the upper portion of the same.

By textile fabrics I mean cotton cloth in rope form.

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

1. A keir comprising a vat capable of containing textile fabrics, a perforated bottom for holding the fabric contents, a non-perforated closed conical receptacle so situated as to downwardly decrease the interior area of the vat, means for introducing a liquid on the top of the fabric and means for removing the liquid from the bottom of the keir only after it has passed by gravity from the top of the fabric to the bottom thereof.

2. A keir capable of containing textile fabrics, the bottom area of the textile container being less than the upper area, the decreased area being caused by a non-perforated closed conical receptacle within the keir, comprising a liquid holding receptacle perforated means for supporting the fabric during the downward flow of a liquid through the fabric, means for admitting liquid at the top, and means for removing the liquid at the bottom after its passage through the fabric by gravity, the decreased area being such that the downward flow of the liquid will allow of a thorough penetration of the textile fabric without its entanglement.

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

JOSEF HIRSCHBERGER.

Witnesses:

ISADORE BERNSTEIN,  
WM. C. DUNN.