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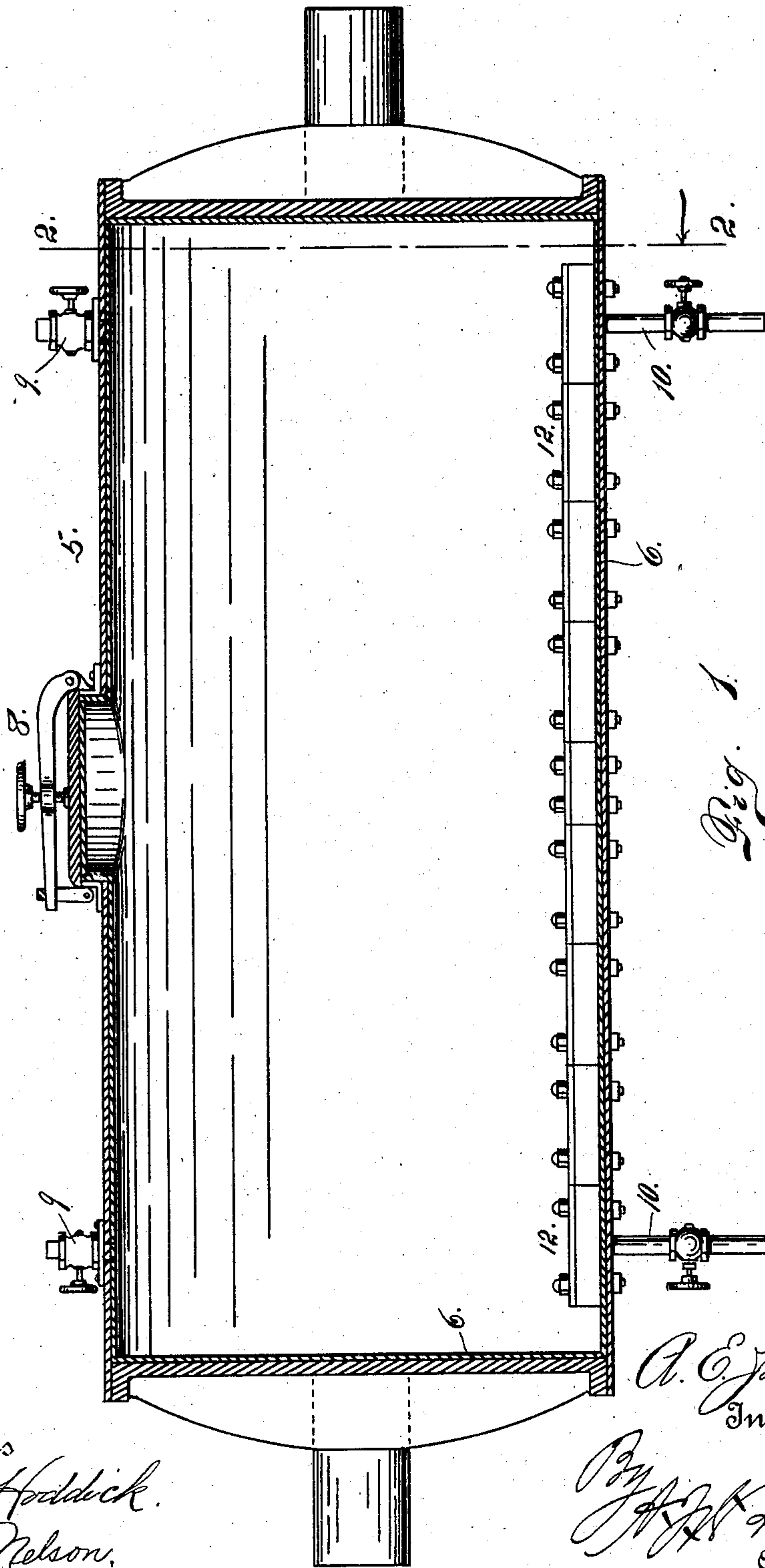
A. E. JOHNSON.

BARREL FILTER.

APPLICATION FILED MAY 25, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses  
Otto E. Haddick.  
Dena Nelson.

A. E. Johnson.  
Inventor

By J. H. Miller.  
Attorney

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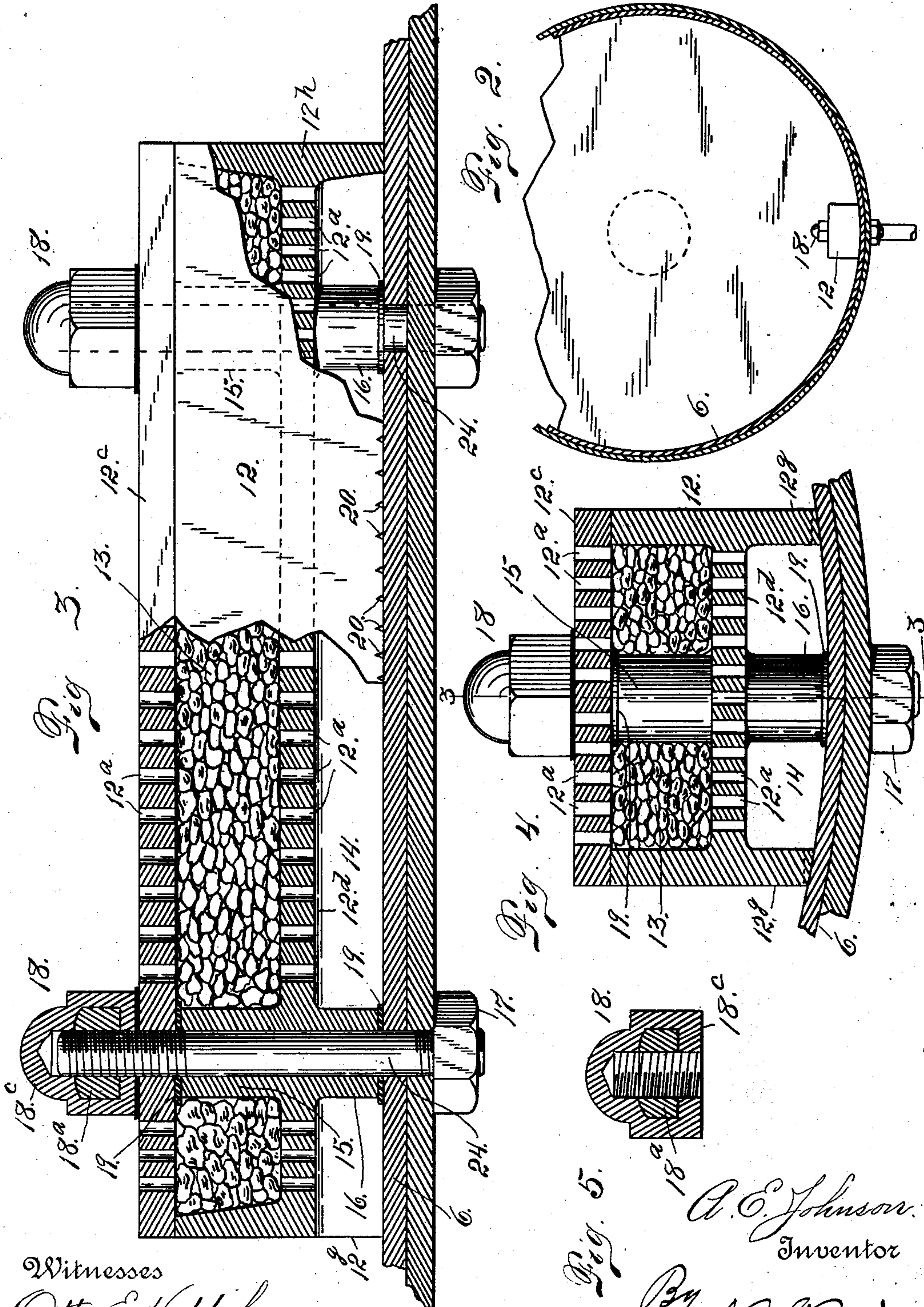
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Otto E. Haddick.  
Dena Nelson.

A. E. Johnson.  
Inventor  
By A. R. Smith  
Attorney



# UNITED STATES PATENT OFFICE.

ALFRED E. JOHNSON, OF COLORADO SPRINGS, COLORADO.

## BARREL-FILTER.

SPECIFICATION forming part of Letters Patent No. 741,499, dated October 13, 1903.

Application filed May 25, 1903. Serial No. 158,647. (No model.)

*To all whom it may concern:*

Be it known that I, ALFRED E. JOHNSON, a citizen of the United States of America, residing at Colorado Springs, in the county of El Paso and State of Colorado, have invented certain new and useful Improvements in Barrel-Filters; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in barrel-filters for use in the separation of solutions containing the dissolved metallic values from the pulp or solid portion of the ore, as in the chlorination process.

My object is to provide an apparatus of this class which shall be capable of effectively performing the filtration function and which shall be reliable, durable, and thoroughly practicable in operation; and to these ends the invention consists of the features, arrangements, and combinations hereinafter described and claimed, all of which will be fully understood by reference to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a longitudinal section taken through a barrel equipped with my improved filter. Fig. 2 is a section taken on the line 2 2, Fig. 1, and partly broken away at the top. Fig. 3 is a sectional view, partly in elevation, showing one of the end members of my filter construction. The sectionized part of this view is taken on the line 3 3, Fig. 4. Fig. 4 is a cross-section of a filter member, cutting the barrel in which the filter is located. Figs. 3 and 4 are shown on a larger scale than Fig. 1. Fig. 5 is a sectional view in detail of a special construction of nut employed in my filter construction.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate a suitable barrel, which is provided with the usual lining 6, composed of lead or other material adapted to resist the action of chlorin, acids, and other substances that may be employed or found necessary in the dissolving of the me-

tallic values of the ore under treatment. This barrel is also provided with end trunnions 7, a manhole 8, valve-controlled inlets 9, and valve-controlled outlets 10.

My improved filter construction, as shown in the drawings, consists of a number of receptacles 12, arranged end to end longitudinally of the barrel and perforated at the top and bottom, as shown at 12<sup>a</sup>, to permit the entrance and escape of the solution. These receptacles or boxes are composed of some material, as lead or an alloy of lead, adapted to resist the action of the chemicals employed in dissolving the metallic values. They are filled with some suitable filtering substance, as granular or other material, 13, adapted to resist the action of the chlorin, acids, or other substances employed. This filtering material is held in place by a removable top plate 12<sup>c</sup>, perforated as aforesaid. The side walls of these boxes or receptacles extend below the perforated bottom 12<sup>d</sup>, as shown at 12<sup>e</sup>, leaving a central longitudinal channel 14 beneath the filter-bottom to allow the filter solution to flow freely to the outlets 10, which communicate with the said channel. The side walls of the members 12 rest on the lead lining of the barrel. The top plate 12<sup>c</sup> is secured to each filter member and to the barrel by two metal studs 24, which are preferably secured to the body part of the member by being placed in the mold when the said member is cast or molded, whereby sleeves 15 and 16, extending upwardly and downwardly from the perforated bottom, are formed and completely protect the metal stud from the action of the chemicals in the solution. These studs have threaded extremities which protrude through openings formed in the barrel and the top plate of the filter member, and they are secured in place by nuts 17 and 18. The nuts 17 are of ordinary construction, since they are located on the outside of the barrel and are not exposed to the action of the solution. The nuts 18 are of special construction and consist of an intermediate metal part 18<sup>a</sup>, forming the nut proper, and an exterior part 18<sup>b</sup>, molded around the metal part and composed of some material, as lead, adapted to protect the metal part of the nut from the action of the solution in the barrel. The metal of the nut is



therefore completely surrounded by the lead, except its interior threaded part, which engages the threads of the studs. To prevent the solutions from reaching the metal stud inside the barrel, washers 19, composed of rubber or other suitable yielding material adapted to resist the action of the solution, are employed. Each stud is provided with three of these washers, one engaging the lead lining, another located underneath the top plate, and another on top of the said plate, thus fully protecting all of the joints, which otherwise would be exposed to the possible entrance of the corrosive liquid.

The lower edges of the side walls of the filter members are provided with V-shaped grooves 20 to permit the filtration of the solution in the barrel below the top of the filter. The outer end walls of each of the end members 12 of the filter extend below the perforated bottom of the member and rest on the lining of the barrel, as shown at 12<sup>h</sup>, in the same manner as the side walls, to prevent the unfiltered solution from entering the channel 14 at these points.

From the foregoing description the use and operation of my improved barrel-filter will be readily understood. After the filter is secured in place in the manner heretofore explained a suitable charge of ore, together with the necessary water and chemicals to produce the dissolving solution, is placed in the barrel, after which the latter is tightly closed and rotated a sufficient length of time to effect a dissolution of the metals which it is desired to save. The tank is then stopped, with the part containing the filter in the lowermost position. Water is then introduced under pressure by way of one of the inlets 9 and the dissolved metallic values removed by filtration from the pulp or solid matter in the barrel. This solution passes through the top plate of the filter, through the filtering material below, thence out at the bottom into the channel 14, and thence out of the barrel through the outlets 10, whose valves are opened for this purpose.

Having thus described my invention, what I claim is—

1. In a barrel-filter, the combination with a suitable barrel or cylinder, of a filter having a perforated bottom, side walls extending below the bottom and engaging the barrel on the inside, filtering material resting on the bottom and confined by the side walls, a top perforated plate, and suitable means for securing the filter in place, a channel being formed underneath the bottom of the filter to receive the filtered liquid, the barrel being provided with a valved outlet in communication with the said channel.

2. In a barrel-filter, the combination with a suitable barrel or cylinder, of a box perforated at the top and bottom and containing a suitable filtering substance, the side walls of the box extending below the bottom and engaging the barrel on the inside, leaving a chan-

nel underneath the filter, to receive the filtered solution, the channel being closed against the entrance of solid material in the barrel and in communication with a suitable valve-controlled outlet with which the barrel is equipped, and suitable means for securing the filter in place within the barrel.

3. A barrel-filter composed of a box having side walls engaging the inner surface of the barrel or lining, a perforated bottom above the bottom of the side walls, a perforated top plate, filtering material located and confined between the two perforated parts, and suitable means for securing the filter in place.

4. A barrel-filter composed of a box perforated at the top and bottom and having a filtering substance interposed and confined between the two perforated parts, the top being detachable and the side walls extending below the perforated bottom to form a channel underneath for the filtered liquid, and suitable means for securing the top plate in place and the filter in position in the barrel.

5. A barrel-filter composed of a box perforated at the top and bottom and provided with an interposed filling of filtering material, the outer walls of the box extending below the bottom and forming a channel for the entrance of the filtered solution, the said box being composed of material adapted to resist the corrosive action of the contained solution.

6. The combination with a suitable barrel or cylinder, of a filter composed of members arranged end to end lengthwise of the barrel, each member being perforated at the top and bottom and provided with an interposed filling of filtering material, the side walls of each member extending below the perforated bottom to form a channel for the entrance of the filtered solution, the end walls of the end members extending below the bottom to close this channel at the ends, the said channel being in communication with the outlet with which the barrel is provided, and suitable means for securing the filter members in place.

7. A barrel-filter consisting of a box composed of material adapted to resist the corrosive action of the contained solution, the said box having a perforated bottom raised above the lower edges of the side walls to form a channel underneath for the entrance of the filtered solution, and a detachable, perforated top plate for holding the filtering material in place, studs passing through the box and through the wall of the barrel, and nuts applied to the studs for holding the filter in place, the inner nut and the stud where it passes through the box, being protected against the corrosive action of the liquid.

8. The combination with a suitable barrel or cylinder, of a filter composed of a plurality of filter members arranged end to end lengthwise of the barrel, each member being composed of material as lead, adapted to resist the corrosive action of the liquid, and each member consisting of a box-like receptacle



having a perforated bottom and a detachable  
perforated top plate, the walls extending be-  
low the bottom to form a channel underneath  
for the entrance of the filtered liquid, studs  
5 passing through the filter members which  
are provided with protecting-sleeves sur-  
rounding the studs, the said studs also pass-  
ing through the wall of the barrel, and nuts  
applied to the threaded extremities of the  
10 studs, the inner nut consisting of an inner  
metal part surrounded by material adapted  
to resist corrosive action.

9. The combination with a suitable recep-  
tacle, of a filter having a perforated bottom,

side walls extending below the bottom and 15  
engaging the receptacle on the inside, filter-  
ing material resting on the bottom and con-  
fined by the side walls, a top perforated  
plate, and suitable means securing the filter  
in place, the side walls extending below the 20  
bottom of the filter forming a channel under-  
neath the filter to receive the filtered liquid.

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

ALFRED E. JOHNSON.

Witnesses:

J. ELMER PARKISON,  
HOWARD MASTERSON.