E. P. DARGIN.

FILTER BAG.

APPLICATION FILED SEPT. 9, 1907.

**957,191.** Patented May 10, 1910.

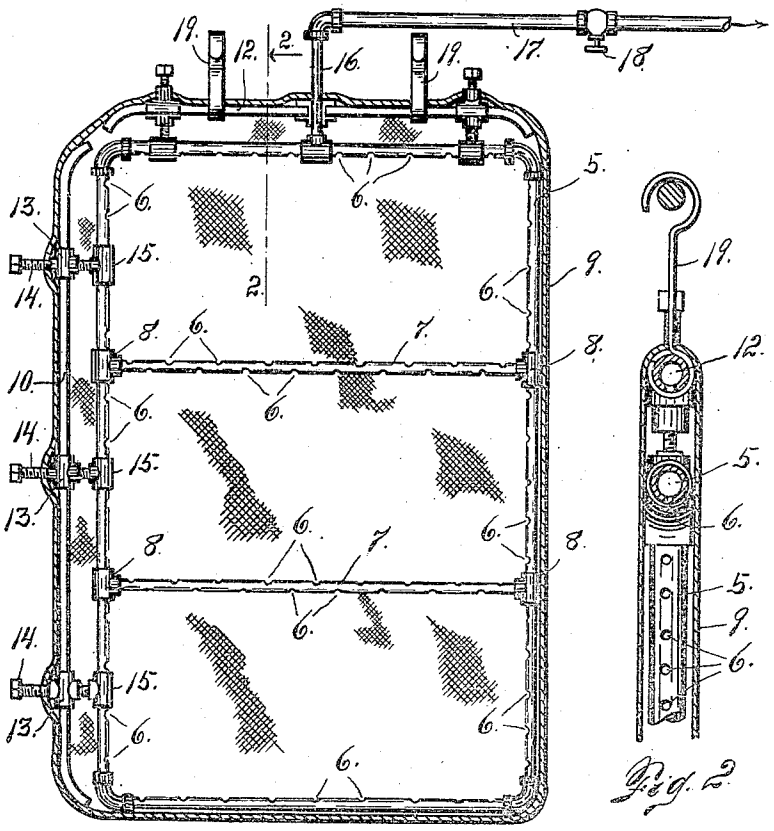

Fig. 1.



Fig. 2.

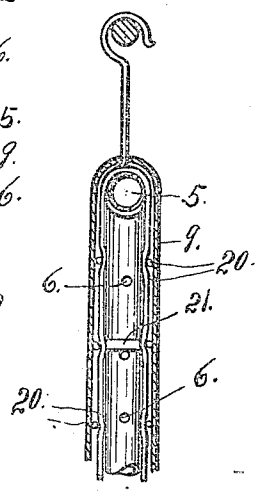

Fig. 4.

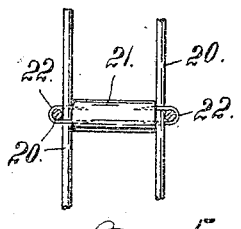

Fig. 5.

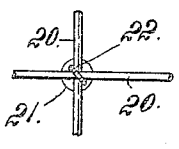

Fig. 6.

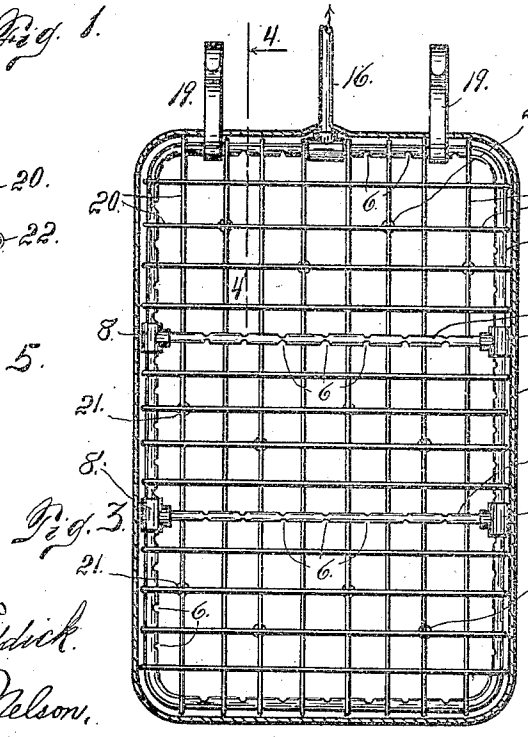

Fig. 3.

Witnesses

Otto E. Hoddick.

Dena Nelson.

Inventor

E. P. Dargin.

By N. J. Noyes

Attorney

ANDREW B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

ERNEST P. DARGIN, OF DENVER, COLORADO, ASSIGNOR TO MARY E. DARGIN, OF DENVER, COLORADO.

## FILTER-BAG.

957,191. Specification of Letters Patent. Patented May 10, 1910.

Application filed September 9, 1907. Serial No. 391,920.

*To all whom it may concern:*

Be it known that I, ERNEST P. DARGIN, a citizen of the United States, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Filter-Bags; 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 bags for filtering solution from slimes of any character. The construction is more especially adapted for use in the separation of chemical solutions containing the dissolved metallic values in the treatment of ores for the purpose of recovering these values.

My improved construction consists of a frame composed of pipe, the contour of the frame being preferably rectangular, and the opposite parallel side members being connected by any desired number of transverse members. The entire pipe frame is constructed so that the various members communicate with each other. This frame with or without a net work covering, is placed within a bag composed of canvas or other suitable mesh material, sufficiently open for the passage of liquid, when the air is exhausted from the inside of the bag.

An important feature of my improved construction, consists in means connected with one side and one end of the pipe frame and within the canvas bag, whereby the bag may be stretched in both directions, the fabric being drawn sufficiently taut to resist compression to a considerable extent. This stretching feature may consist of a bar applied to one side and a separate bar applied to one end of the structure and in which are threaded adjusting bolts whose inner extremities bear upon the pipe frame. By turning these bolts, the said bars are moved outwardly, whereby the canvas or filtering medium forming the covering for the frame, is stretched to any desired tension.

Having briefly outlined my improved construction, I will proceed to describe the same in detail reference being made to the accompanying drawing in which is illustrated an embodiment thereof.

In this drawing, Figure 1 is a section taken through one form of my improved filter bag, the rectangular pipe frame being shown in elevation. Fig. 2 is a section taken on the line 2—2 Fig. 1, parts being shown on a larger scale. Fig. 3 is a view similar to Fig. 1 but showing a modified form of construction. Fig. 4 is a section taken on the line 4—4 Fig. 3. Fig. 5 is an enlarged view partly in section illustrating the manner of attaching the spacing blocks to the web or netting shown in Figs. 3 and 4. Fig. 6 is another view of the same.

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

Let the numeral 5 designate a rectangular pipe frame, perforated as shown at 6. The parallel side members of this frame are connected by transverse perforated members 7. Any desired number of these members 7 may be employed. As shown in the drawing the extremities of the members 7 are connected with the side bars of the frame 5 by T-joints 8. Surrounding this pipe frame is a bag 9 composed of some suitable filtering medium as canvas or other suitable mesh material adapted to perform the filtering function. Located within the bag at one side thereof, is a bar 10; while at one end of the bag is a similar bar 12. These bars are provided with reinforcements 13, provided with openings in which are threaded adjusting bolts 14. The inner extremities of these bolts bear against seats formed in sleeves 15 mounted on the pipe frame. The head extremities of these bolts, protrude exteriorly from the filter bag, whereby they are accessible for purposes of adjustment. These bolts may be turned by the use of a wrench, in a proper direction to cause the bars to move outwardly, and impart the necessary or desired degree of tension to the filtering bag.

As shown in the drawing, an exhaust pipe 16, is connected with the pipe frame, and protrudes from the bag, its outer extremity communicating with the pipe 17 having a valve 18. The pipe 17 may lead to any suitable exhausting apparatus.

As shown in Figs. 1 and 2 of the drawing,

the end bar 12 is equipped with suspension hooks 19, to facilitate the suspending of the bag within the slime tank (not shown).

In the form of construction shown in Figs. 3 and 4, the rectangular frame is substantially of the same construction as shown in Figs. 1 and 2 and will therefore be designated by the numeral 5 while the perforated cross members will be designated by the reference character 7. In this form of construction the pipe frame is covered with a netting or web 20 composed of rope or cord interlaced or suitably woven together. This web serves to prevent the two sides of the filter bag from being drawn together by the exhaust, and to a certain extent takes the place of the tension applied to the bag by means of bars 10 and 12 and their adjusting bolts, in the other form of construction. This rectangular pipe frame covered with the web, is placed within the filter bag which may be designated 9 the same as in the other form of construction. In this form of the device, it is preferred to place spacing blocks 21 which may be located at any desired number of the intersections of the strands of the web. These spacing blocks may be connected with the web in any suitable manner as by means of staples 22 which may be applied as shown in Figs. 5 and 6.

When my improved filter bag is in use, it may be suspended from the tank (not shown) containing the solution by the use of the suspension hooks 19. The exhausting means (not shown) being then put in operation, the bag is exhausted of its air, causing the liquid to pass through the filtering medium into the bag by virtue of the vacuum pull. This liquid which enters the bag, passes into the perforated frame, and thence into the discharge pipe 17 which is connected with the exhausting apparatus. After all the solution has been removed from the tank or chamber within which the bag is suspended, a portion of the slime or residue from which the solution has been removed, will cling to the outside of the bag. This may be removed by removing the residue from the tank and supplying the latter with fresh solution, which will act to disengage the slime from the bag so that the operation may be continued. Or when the filtering operation has been completed for the particular time in question, the slimes may be washed from the bag by applying water exteriorly thereto, or by introducing water or compressed air into the interior of the bag, as may be desired.

As the use of both forms of my improved filter bag construction, is substantially the same, further explanation is deemed unnecessary. It may be stated, however, that previous to the commencement of the filtering operation, with the form of construction shown in Figs. 1 and 2, the bolts 14 must be tightened sufficiently to give the fabric of the canvas bag the desired tension, in order to prevent the same from collapsing under the influence of the vacuum pull due to the operation of the exhaust apparatus, since in the form of construction shown in the last named figures, it is this tension of the canvas bag fabric, which largely acts to prevent the two sides of the bag from coming together in such a manner as to interfere with the filtering process. In the form of construction shown in Figs. 3 and 4, the spacing blocks mounted on the web inclosing the perforated pipe frame, serve to keep the sides of the canvas bag from coming together as heretofore explained.

Having thus described my invention, what I claim is:

1. A filter bag comprising a perforated pipe frame covered with a filtering medium, bars located within the medium and screws threaded in said bars for preventing the sides of the filtering medium from coming together under the influence of the vacuum pull, and suitable means communicating with the perforated pipe frame for exhausting the bag, causing the exterior solution to enter the same through the filtering medium of which it is composed, and removing the solution from the bag, substantially as described.

2. A filter consisting of a bag composed of a filtering medium, a perforated pipe frame inserted in said bag, and transverse perforated pipes connecting the side bars of the said frame and adjustable bars for stretching the sides of the bag to the desired tension to prevent collapse under the influence of exhausting apparatus connected with the perforated frame, substantially as described.

3. In filtering apparatus, the combination of a rectangular perforated pipe frame, transverse perforated pipes connecting the side bars of the frame and communicating therewith, an exhaust pipe connected with the perforated frame, a bag composed of a filtering medium, inclosing the perforated frame, bars located within the bag, and screws threaded in said bars and engaging the perforated frame for stretching the fabric of the bag to the desired tension, substantially as described.

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

ERNEST P. DARGIN.

Witnesses:
DENA NELSON,
MAY GAWLEY.