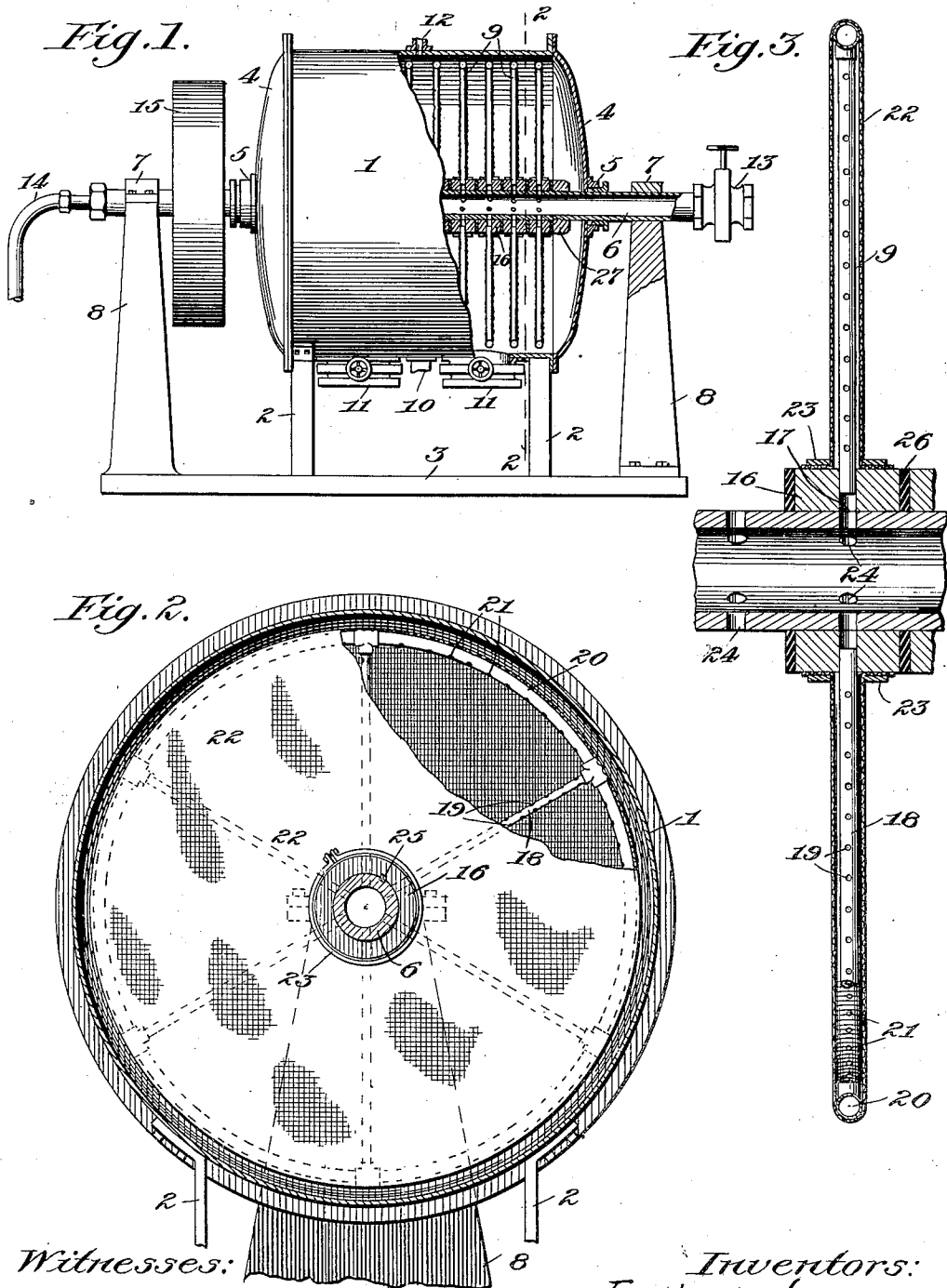


J. H. HEDGES & J. ALLINGHAM.
METALLURGICAL FILTER.

APPLICATION FILED DEC. 7, 1907.

920,739.

Patented May 4, 1909.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOSEPH H. HEDGES AND JOHN ALLINGHAM, OF GUANACEVI, MEXICO.

METALLURGICAL FILTER.

No. 920,739.

Specification of Letters Patent.

Patented May 4, 1909.

Application filed December 7, 1907. Serial No. 405,619.

To all whom it may concern:

Be it known that we, (1) JOSEPH H. HEDGES and (2) JOHN ALLINGHAM, citizen of (1) the United States, and (2) British subject, residing at Guanacevi, Durango, Mexico, have invented certain new and useful Improvements in Metallurgical Filters, of which the following is a specification.

The object of this invention is to provide an apparatus for filtering slimes, sands, or mixtures of these from metal-bearing solutions.

A preferred form of apparatus is shown in the accompanying drawings wherein—

Figure 1 is an elevation, partly in central vertical section, of a pressure filter embodying the invention; Fig. 2 is a vertical section on a somewhat larger scale on line 2—2 of Fig. 1; and Fig. 3 is a central vertical section of one of the filters on an enlarged scale.

Referring to the figures 1 represents a cylindrical shell or casing supported upon standards 2 mounted on a base plate 3. The shell is shown as provided with removable convex heads 4, having central stuffing boxes 5, 5 through which passes a horizontal tubular shaft 6, the ends of which are supported in bearings 7 carried by suitable standards 8 mounted on the base plate 3. One of the standards 8 is removably secured to the base plate in order to facilitate the removal and replacement of the filters.

9, 9 are filters carried by the tubular shaft 6 and communicating with the interior thereof as hereinafter described.

The casing 1 is provided with an inlet aperture 10 for the slimes or the like, suitable valved discharge apertures 11, 11 for the cake or solid residue from the filtration, and an inlet 12 for compressed air.

13 is a gate valve controlling the outflow of the filtered liquid through the tubular shaft 6, and 14 is an armored hose for supplying water or compressed air to the said shaft and thence to the interior of the filter frames, the hose 14 being secured to the shaft 6 by means of a revoluble coupling.

15 represents a pulley mounted on the shaft 6 and serving to rotate the same together with the filters.

A preferred form of filter is constructed as follows: A collar 16 adapted to fit closely over the shaft 6 is provided with radial holes 17 shown as six in number; into these holes are screwed or otherwise secured radial pipes 18, perforated on opposite sides as indicated

at 19, the ends of the pipes 18 being joined by curved pipes 20 which together form a circle of which the pipes 18 are radii. The pipes 20 may also be perforated as indicated at 21. The above construction constitutes a rigid frame adapted to support the filters, which comprise sheets of canvas, filter-cloth or the like 22, disposed on each side of the frame and sewed together around its periphery, the central portions of the sheets 22 being secured upon the outer periphery of the collar 16 by means of clamps 23. Preferably sheets of cocoanut matting or other suitable material are stretched upon each side of the frame before applying the filtering layer thereto. The filters so prepared are assembled upon the shaft 6, which is provided at suitable intervals with radial holes 24, corresponding to the radial holes 17 in the collar 16, and kept in registry therewith by means of a feather 25. In assembling the frames upon the shaft gaskets 26 are interposed between the collar 16 to prevent leakage, and the whole is secured in place by means of lock nuts 27.

In operation, the material to be filtered is introduced through the feed pipe 10 under suitable pressure, usually about 80 pounds per square inch. The liquid portions or metal-bearing solutions pass through the canvas and filling, thence through the perforations of the pipes constituting the filter-frame, and into the hollow shaft, to be conducted away and subjected to suitable treatment for recovery of the values. The solids are retained in the form of a coating or cake on the outer surfaces of the filters. When sufficient cake has been accumulated the excess slimes or other substances are returned to the slime tanks, and wash water is introduced under pressure into the casing. After thorough washing the discharge valves are opened, the valve 13 is closed, and water or air is introduced under pressure through the armored hose 14 in order to dislodge the cake from the filters; the dislodged cake is then discharged from the casing, being usually flushed out by water introduced for instance through the pipe 12. Compressed air may also be introduced through the pipe 12 for drying the cake previous to its dislodgment. The filters are preferably rotated slowly throughout the operation in order to agitate the material in the casing to prevent the settling of fine sands or other relatively heavy materials which may be present, and to in-

sure the production of a homogeneous cake of uniform thickness, care being taken to avoid such rapid rotation as might serve to detach the formed cake from the surfaces of the filter.

We claim:

1. A rotary metallurgical filter comprising a casing, a conduit extending into the same and provided with apertures, hollow, perforated filter-frames mounted upon said conduit over said apertures, each frame comprising hollow radial arms provided with perforations and peripheral frame members extending between the outer ends of said arms, filters carried by said frames, and means for rotating said filters.

2. A rotary metallurgical filter comprising a casing, a tubular shaft traversing the same and provided with apertures opening within the casing, filter frames mounted upon said shaft, each frame comprising a collar having radial apertures, hollow radial arms secured to said collar and provided with perforations, and peripheral frame-members extending between the outer ends of said arms, filters covering said arms, and means for rotating said shaft and filters.

3. A rotary metallurgical filter comprising

a casing, a tubular shaft traversing the same and provided with apertures opening within the casing, filter-frames mounted upon said shaft, each frame comprising a collar having radial apertures, hollow radial arms secured to said collar and provided with perforations, and hollow perforated, peripheral frame members extending between the outer ends of said arms, filters covering said frames, and means for rotating said shaft and filters.

4. In a rotary metallurgical filter, a filter frame comprising a collar having radial apertures, hollow radial arms secured to said collar and provided with perforations, peripheral frame-members extending between the outer ends of said arms, and a filter covering said frame and secured to said collar.

In testimony whereof, we affix our signatures in presence of the witnesses.

JOSEPH H. HEDGES.
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