

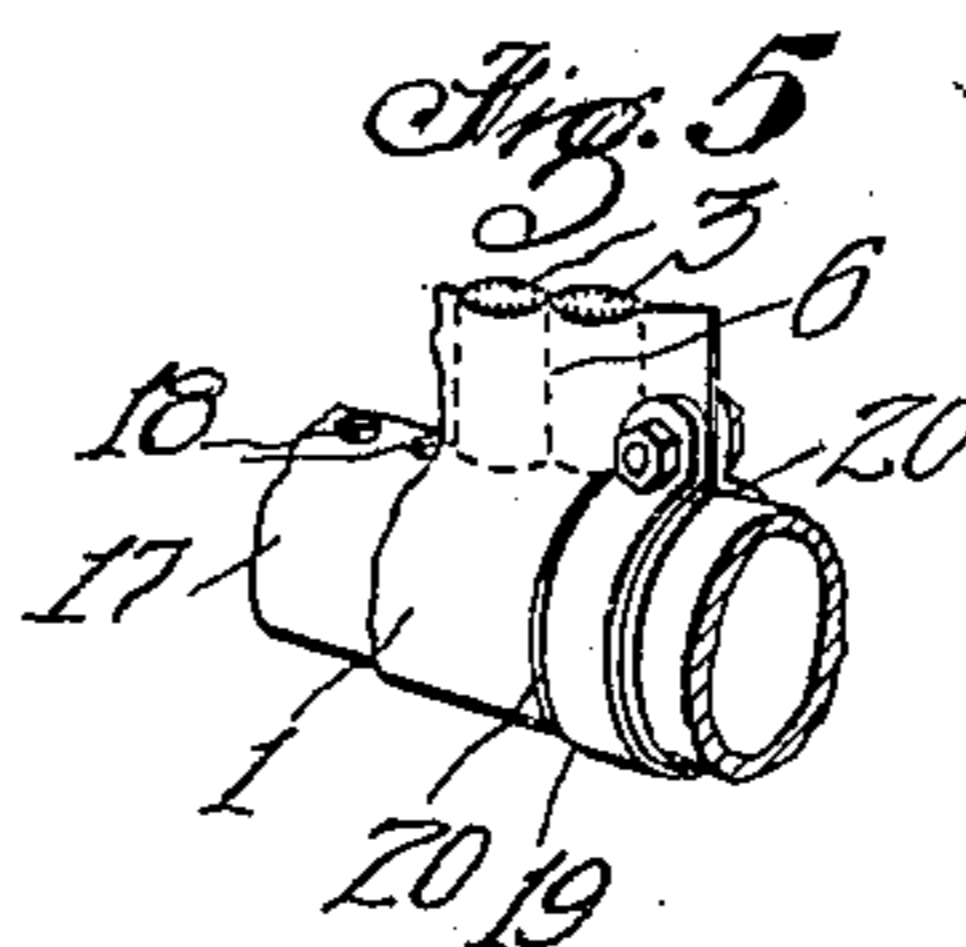
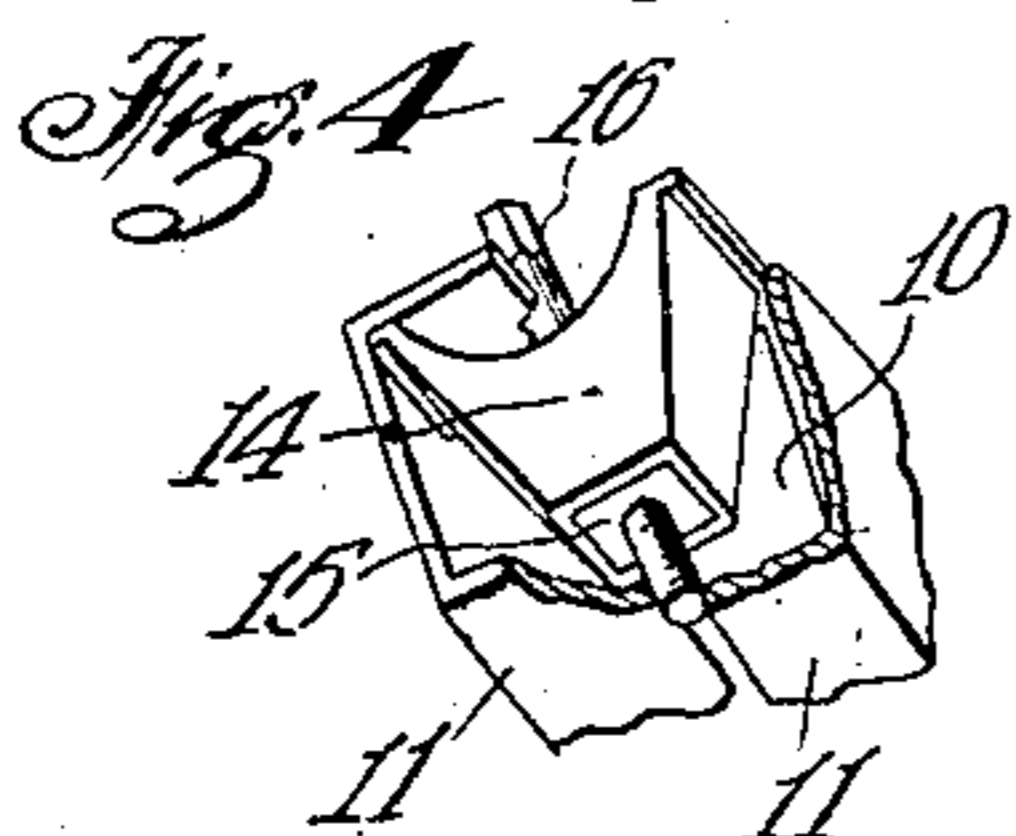
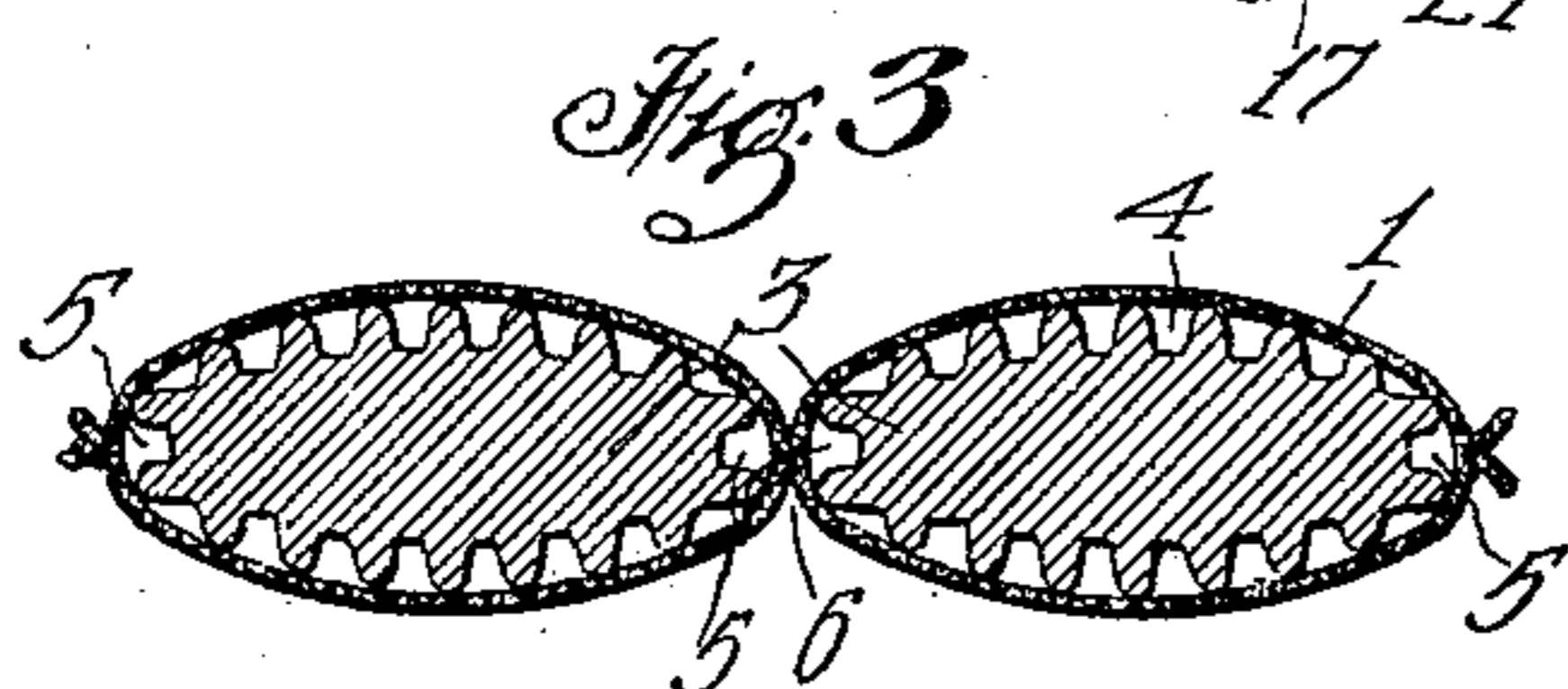
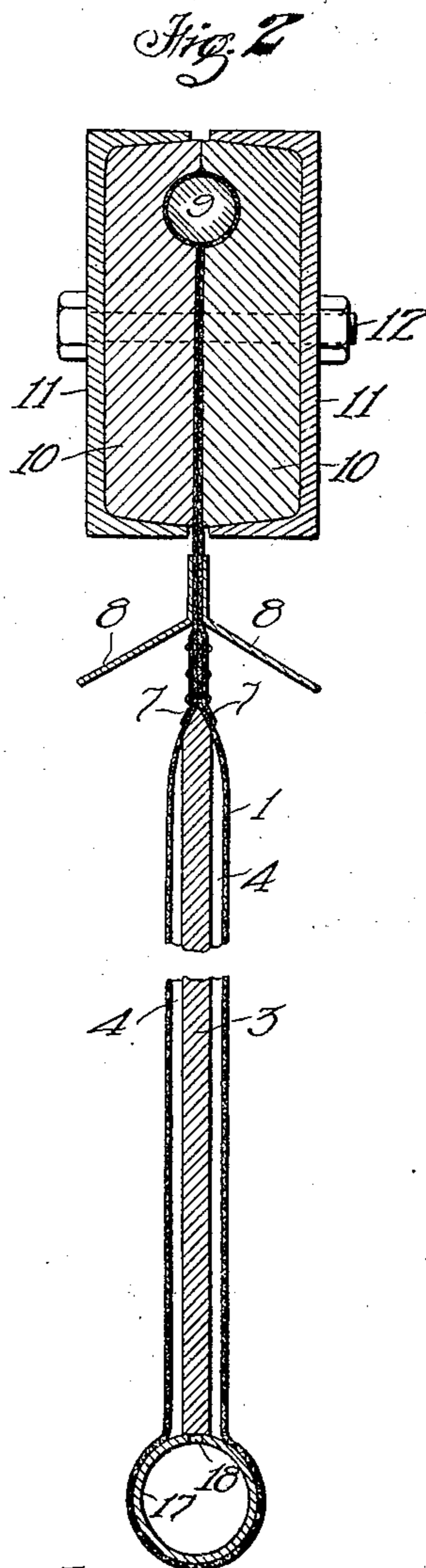
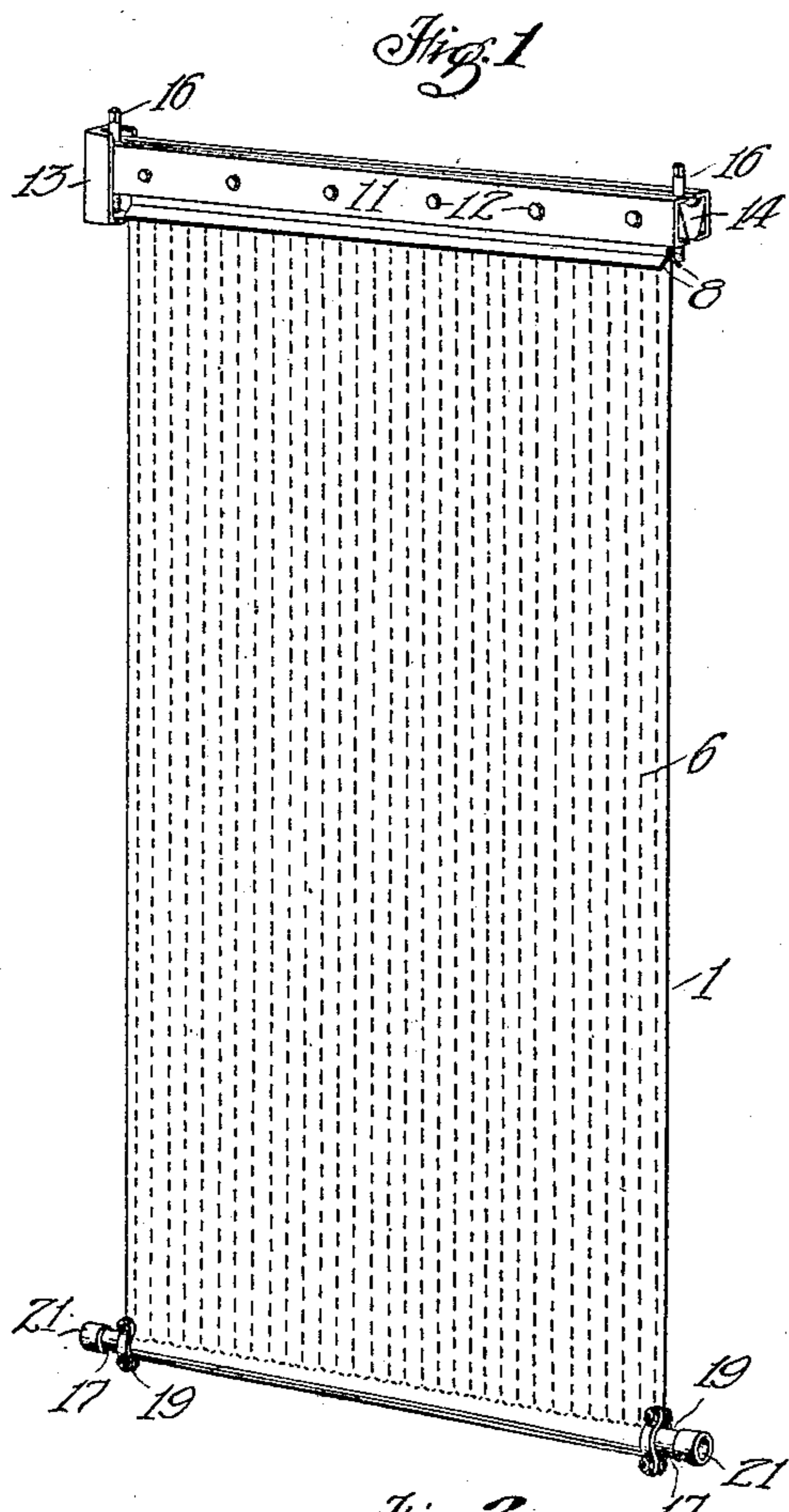
H. W. BLAISDELL & H. A. BROOKS.

FILTER LEAF.

APPLICATION FILED NOV. 16, 1907.

925,554.

Patented June 22, 1909.



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UNITED STATES PATENT OFFICE.

HIRAM W. BLAISDELL AND HARRY A. BROOKS, OF LOS ANGELES, CALIFORNIA.

FILTER-LEAF.

No. 925,554.

Specification of Letters Patent.

Patented June 22, 1909.

Application filed November 16, 1907. Serial No. 402,570.

To all whom it may concern:

Be it known that we, HIRAM W. BLAISDELL, a citizen of the United States of America, and HARRY A. BROOKS, a subject of the King of Great Britain, both residing at Los Angeles, California, have invented a certain new and useful Filter-Leaf; and we hereby 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.

This invention relates to filter leaves of the type particularly adapted to hydro-metallurgical apparatus for separating slimes or fine particles of ore from the liquids in which they are suspended.

One object thereof is to provide in a filter leaf, in combination with sheets of filtering material, improved means for draining liquid from and delivering liquid to said leaf, said means serving the function of separating or distending said sheets at intervals from each other.

With the above object in view, specially formed grooved distenders are arranged between the sheets of filtering material in the filter-leaf, said distenders being so formed and constructed that the sheets of filtering material are stretched in a continuous curve over convex surfaces between the points of attachment of the filtering material whereby is obviated flexure of the filtering material and the consequent cracking of the cake or layer of residuum thereon, on variation of the pressures interiorly and exteriorly of the leaf.

Further objects and the advantages of the invention will be apparent from the description of one form in which the invention may be embodied, reference being had to the accompanying drawing in which—

Figure 1 is a perspective view. Fig. 2 is a vertical section partly broken away. Fig. 3 is a horizontal section through a portion of the filtering surfaces, showing the distenders. Fig. 4 is a perspective detail of part of the supporting means. Fig. 5 is an enlarged perspective view of the clamp used to prevent leakage at the outlet pipe connections.

Reference numerals 1 and 2 designate sheets of filtering material between which are arranged a plurality of distenders 3, each preferably double-convex in form and having side grooves 4 and grooves 5. The distenders 3 are held in suitable position within the sheets of filtering material in this instance by lines of sewing 6; other fastenings between

said distenders, may, however, be employed. The upper end of each distender is flattened, preferably by rounding the sides as shown in Fig. 2. The sheets of filtering material extend upward a short distance above the ends of the distenders and are brought together between the lower edges of a strip of canvas 7 and united to each other and said canvas by sewing or other suitable means. Wings 8 are fastened to the upper part of the leaf to deflect any drip and prevent it running down over the surface thereof. A rod 9 is inserted in the upper part of the loop formed by the fold in strip 7 and said rod and loop are placed between grooved rails 10 on the outside of which are channel bars 11. Bolts 12 passing through said rails and channel bars, clamp rod 9 and strip of canvas 7 securely in place. Channel bars 11 are somewhat longer than the width of the leaf and at each end are supported in castings 13, Fig. 1, being made adjustable therein in the following manner to allow of the filtering material being stretched when desired.

In each of the spaces included between the ends of channel bars 11 is inserted a casting 14 the lower part of which is recessed to receive a nut 15 through which passes a bolt 16, the upper end of which is square and the lower end rests upon the bottom of casting 13. The flanges of channel bars 11 are cut away to allow bolts 16 to pass between them.

The lower part of the filter leaf is provided with a pipe 17 having perforations 18. A clamp 19 is used in conjunction with a sheet of packing material 20 to prevent leakage at each of the points where pipe 17 passes out of the leaf. Pipe 17 can be connected to any suitable means for conducting the filtrate to any desired place by couplings 21.

The method of operation of this device is as follows: The leaf being supported in a suitable receptacle by castings 13, and sleeves 21 being connected to a pipe passing out of the receptacle, material to be filtered is introduced into the receptacle. A greater pressure is caused to be exerted upon the material outside the filter leaf than exists within the same. The filtrate passes through the sheets 1 and 2 of filter material into the grooves 4 and 5 of distenders 3 and flows through perforations 18 into pipe 17 which delivers it to the means for carrying to the place desired. A cake or layer of residuum is formed upon the surface of the leaf, being more readily retained thereon by reason of

the said surface being corrugated. This cake may be treated by having reagents and washes forced through it in the usual manner. To discharge the cake from the leaf, fluid under sufficient pressure to overcome the pressure from without the leaf, is admitted to the interior of the leaf through pipe 17. This fluid going along the grooves 4 and 5 of distenders 3, passes through the sheets of filtering material 1 and 2 whereupon the cake of residuum falls from the filter leaf. The sheets of filtering material being stretched over curved surfaces between their points of attachment to each other, there is no possibility of flexure and consequent cracking of the cake or layer of residuum as the pressures interiorly and exteriorly of the leaf vary. The deflecting wings 8 prevent furrowing of the cake by drip from the supporting rail.

We claim:

1. In a filter leaf, sheets of filtering fabric, vertical lines of fastenings holding said sheets in contact with each other at intervals, means for holding said sheets of fabric apart between said points of contact and adjustable means for holding said leaf.

2. In a filter leaf, sheets of filtering fabric, means for holding said sheets together at intervals, a device for holding said sheets apart in each of the spaces between said holding means and means on the upper part of the leaf for holding and stretching said leaf.

3. In a filter leaf, sheets of filtering fabric, means for holding said sheets together at intervals, devices for holding said sheets apart between said holding means, conduits in said devices, means for removing fluid from said conduits and means to stretch the leaf.

4. In a filter leaf, sheets of filtering fabric, lines of sewing uniting said sheets at close intervals, means for holding said sheets of fabric apart between said lines of sewing, conduits in said means, means for removing fluid from said conduits and means for holding and stretching the leaf.

5. In a filter leaf, sheets of filtering material, means for holding said sheets together at intervals, distenders fitted in said filtering material between said holding means, said distenders formed substantially double-convex in cross-section, passageways in said distenders, and adjustable means fitted to the upper part of the leaf to hold said leaf.

6. In a filter leaf, sheets of filtering material, means for holding said sheets together at intervals, grooved distenders between said holding means, and means for holding and stretching the leaf.

7. In a filter leaf, sheets of filtering material, a loop of material at the upper part thereof, a rod within said loop and rails having grooves, clamped upon said loop and rod.

8. In a filter leaf, sheets of filtering material, a loop of material at the upper part thereof, a rod within said loop, a grooved rail at each side of said rod, channel bars outside of said rail and means to clamp said rod, rail and channel bars together.

9. In a filter leaf, sheets of filtering material, means to hold said sheets in contact at intervals, distenders between said holding means, supporting devices at the upper part of said leaf and deflecting wings affixed to the leaf below said supporting devices.

10. In a filter leaf, means for holding the lower edge of said leaf in position and devices for raising and supporting the upper edge of said leaf.

11. In a filter leaf, sheets of filtering fabric, lines of sewing uniting said sheets, distenders between said sheets and grooves in said distenders, adjacent to said sewing.

12. In a filter leaf, sheets of filtering fabric, lines of sewing uniting said sheets, distenders between said sheets and grooves in the edges of said distenders, adjacent to said sewing.

13. The combination with sheets of filtering material, of lines of fastening uniting said sheets at intervals, a plurality of narrow grooved double-convex distenders between said sheets of material, the top surfaces of the ridges between the grooves in said distenders lying in a continuous curve next to the filtering material, substantially as described and for the purpose set forth.

14. In a filter leaf, sheets of filtering fabric united at intervals by lines of fastening, double-convex distenders between said sheets, and grooves in said distenders adjacent to said fastening.

15. In a filter leaf, sheets of filtering fabric, lines of fastening uniting said sheets at intervals, distenders between said sheets, grooves in the edges of said distenders adjacent to the lines of fastening, and a conduit at the lower part of the leaf for conducting fluid to or from the grooves in said distenders.

16. The distender 3 formed double-convex and provided with side grooves 4, substantially as shown, for the purpose specified.

17. The distender 3 formed double-convex and provided with side grooves 4 and with grooves 5, substantially as shown, for the purpose specified.

In testimony whereof, we have signed our names to this specification in the presence of two subscribing witnesses at Los Angeles, county of Los Angeles, State of California, this 7th day of November, A. D. 1907.

HIRAM W. BLAISDELL.

HARRY A. BROOKS.

Witnesses:

ARTHUR B. WALLABER,
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