

No. 859,455.

PATENTED JULY 9, 1907.

F. B. LEOPOLD.
STRAINER.

APPLICATION FILED NOV. 2, 1906.

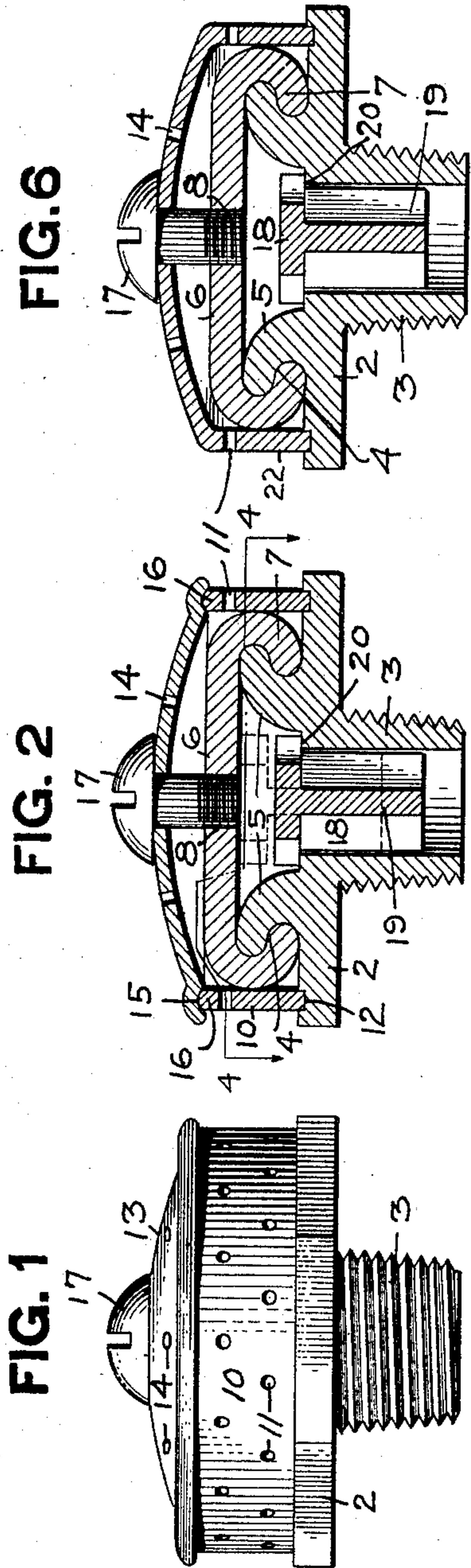


FIG. 6

FIG. 2

FIG. 1

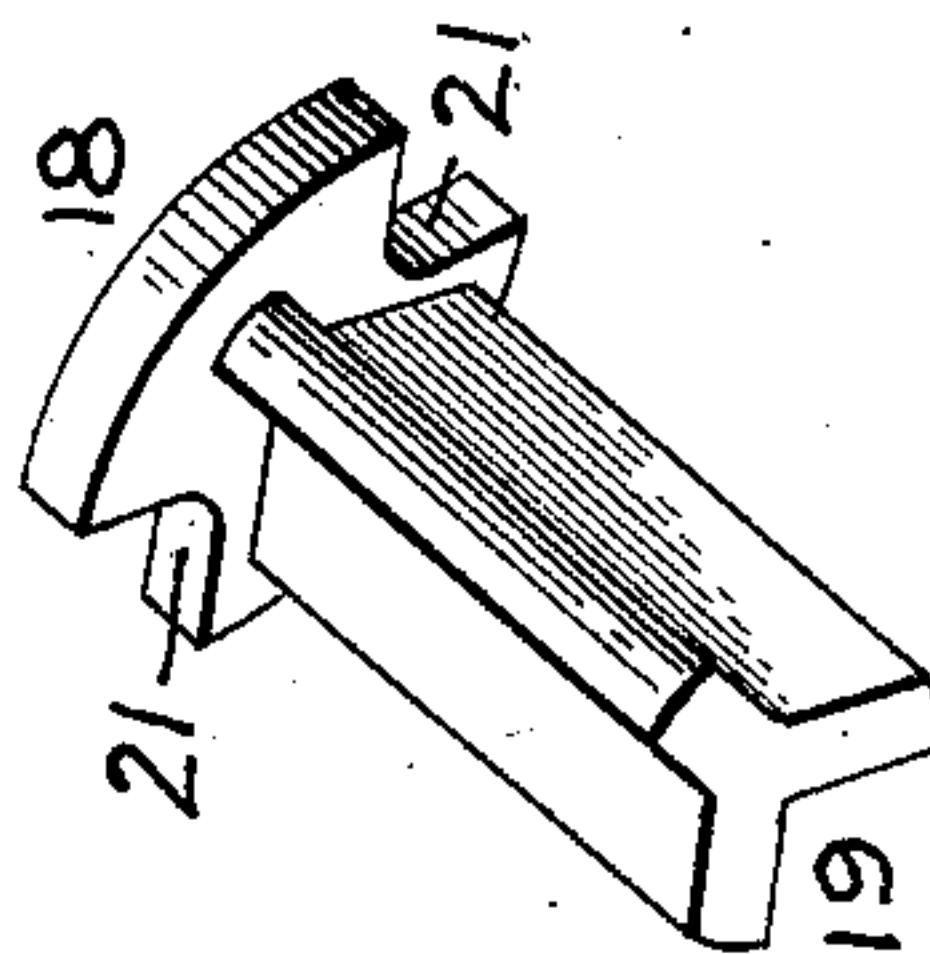


FIG. 5

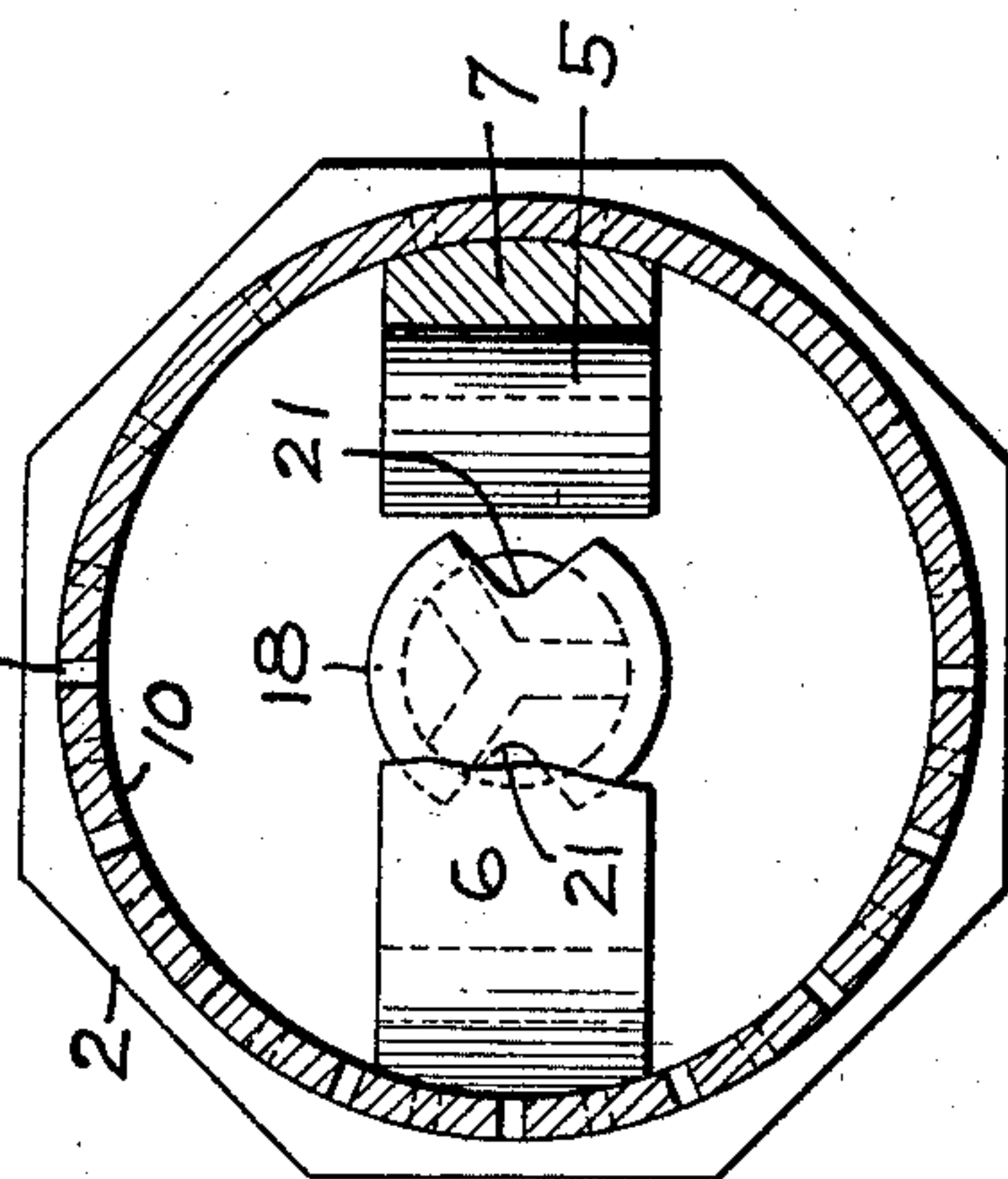


FIG. 4

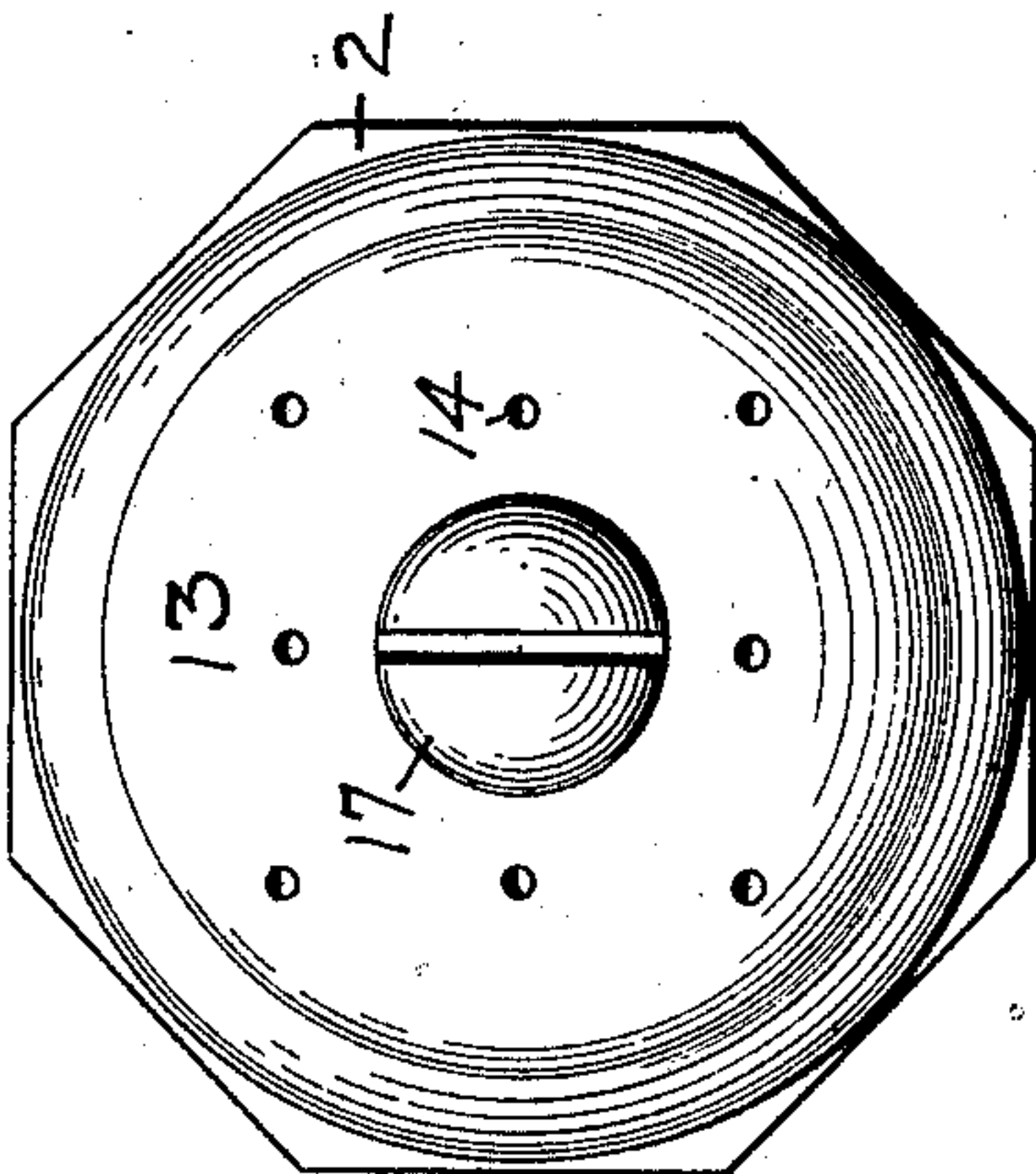


FIG. 3

WITNESSES.

J. R. Heller
Robert C. Zotten

INVENTOR.

Fredrick B. Leopold
By May Zotten & Wenter
attorneys

UNITED STATES PATENT OFFICE.

FREDERICK B. LEOPOLD, OF EVANSTON, ILLINOIS, ASSIGNOR TO PITTSBURGH FILTER MANUFACTURING COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

STRAINER.

No. 859,455.

Specification of Letters Patent.

Patented July 9, 1907.

Application filed November 2, 1905. Serial No. 285,652.

To all whom it may concern:

Be it known that I, FREDERICK B. LEOPOLD, a resident of Evanston, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Strainers; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to strainers for filters.

One of the objects of my invention is to provide a strainer of such construction that the frictional resistance of the filtered water at the perforations is reduced to a minimum so as to decrease the tendency of grains of sand being drawn to this point and thereby clogging up said perforations; and on the other hand to increase the frictional resistance at the perforations when the flow of water is reversed in cleaning so that the wash water will be discharged from said perforations at high velocity to dislodge the sand caked around the strainers and disintegrate the mass so that all parts will be thoroughly agitated and cleaned.

Another object of my invention is to provide a strainer with readily removable parts so that the parts particularly subject to wear may be removed and replaced by new ones without the necessity of removing the body of the strainer from the underdrains and tearing up the concrete floor.

In the accompanying drawing Figure 1 is a side elevation; Fig. 2 is a sectional view in elevation; Fig. 3 is a top view; Fig. 4 is a section on line 4—4 Fig. 2; Fig. 5 is a perspective view of the valve; Fig. 6 is a modified form.

In the drawing the numeral 2 designates the base piece of my improved strainer which may be formed of brass, phosphor bronze, or other suitable metal. This base-piece 2 is provided with the threaded tail-piece 3 adapted to be connected up to threaded seats in the under-drains or pipes of an ordinary sand filter plant. The base-piece 2 is further provided with locking seat 4 formed by the projecting lugs 5. Engaging the locking seat 4 and held immovably therein against upward movement is the cross-piece 6. This cross-piece 6 has the inwardly projecting ends 7 which are adapted to slide into the locking seat 4 by a horizontal movement. A threaded seat 8 is formed in the cross-piece 6.

An annulus 10 which may be formed of a section of tubing if desired, is provided with perforations 11, and said annulus rests on a groove 12 formed in the base-piece 2. A cap 13 with perforations 14 has the annular groove 15 which engages the rounded upper edge 16 of the annulus 10.

A screw 17 passes through a central opening in the cap 13 and screws into the threaded seat 8 in the cross-

piece 6. In this manner the annulus 10 and cap 13 are firmly and rigidly secured to the base-piece 2 so as to form a substantially integral construction. 55

A valve 18 of the check-valve type has the stem 19 which fits down within the tail-piece 3 of the base 2, the upper end of said valve resting normally on the seat 20, and the cross-piece 6 serving as a stop to limit the upward movement of said valve. The valve 18 60 has the notches 21 which when the valve is seated, form a combined opening leading to the tail-piece less in area than the combined openings of the perforations. As a consequence the greatest frictional resistance of the water coming from the filter bed under 65 high pressure will be at the point of passage through notches of the valve 18 instead of at the perforations in the strainer.

By my improved strainer the frictional resistance at the perforations of the strainer is so reduced that there 70 is less tendency of the sand being drawn into the perforations to clog the same while at the same time the greatest wear is transferred to the valve 18. This valve when worn is readily replaced by a new one at much less cost than the replacement of either the cap 75 13 or annulus 10. Furthermore, when the flow of water is reversed for cleaning the filter bed the wash water under pressure passes up through the strainer and lifts the valve 18 so that the area of the opening through which the wash water enters the strainer exceeds the combined area of the perforations and as a consequence the frictional resistance is greatest at the 80 perforations and the water is ejected from said perforations with great force to break up the sand around the strainers and agitate and disintegrate the sand of the 85 filter bed so as to subject each particle to the washing action of the water.

If the valve 18 becomes worn so that it is necessary to replace it with a new one it is a very simple matter to remove the cap 13 by unscrewing the screw 17, and 90 withdraw the cross-piece 6 to remove the said valve. Furthermore, the perforated cap and annulus are readily replaced by new ones without disconnecting the base of the strainer from the underdrains and disturbing the concrete floor of the filter. In Fig. 6 I 95 have shown a modified form in which the cap 22 is made in one piece.

What I claim is:

1. A strainer comprising a shell, or casing, having openings therein, and having an outlet, a valve within said 100 shell controlling said outlet having an opening therein, the area of said opening being less than the combined area of said openings in said shell.

2. A strainer comprising a shell, or casing, having openings therein, and having an outlet, an automatically op- 105

erated valve within said shell controlling said outlet having an opening therein, the area of said opening being less than the combined area of said openings in said shell.

5 3. A strainer comprising a shell, or casing, having openings therein, and having an outlet, a check-valve within said shell controlling said outlet having an opening therein, the area of said opening being less than the combined area of said openings in said shell.

10 4. A strainer comprising a shell, or casing, having openings therein, and having an outlet, a check valve controlling said outlet, said valve having notches formed therein, the area of the openings formed by said notches when said valve is seated being less than the combined area of said openings in said shell.

15 5. A strainer comprising a shell, or casing, having openings therein, and having an outlet, a valve within said shell having an opening therein controlling said outlet, the

area of said opening being less than the combined area of said openings in said shell, and the area of said outlet when the valve is raised being greater than the combined area of said openings in said shell. 20

6. A strainer comprising a shell, or casing, having openings therein, and having an outlet, a valve within said shell having an opening therein controlling said outlet, the area of said opening being less than the combined area of said openings in said shell, and a stop in the path of said valve. 25

In testimony whereof, I the said FREDERICK B. LEOPOLD have hereunto set my hand.

FREDERICK B. LEOPOLD.

Witnesses:

ROBERT C. TOTTEN,

J. R. KELLER.