

R. S. BROWNE.

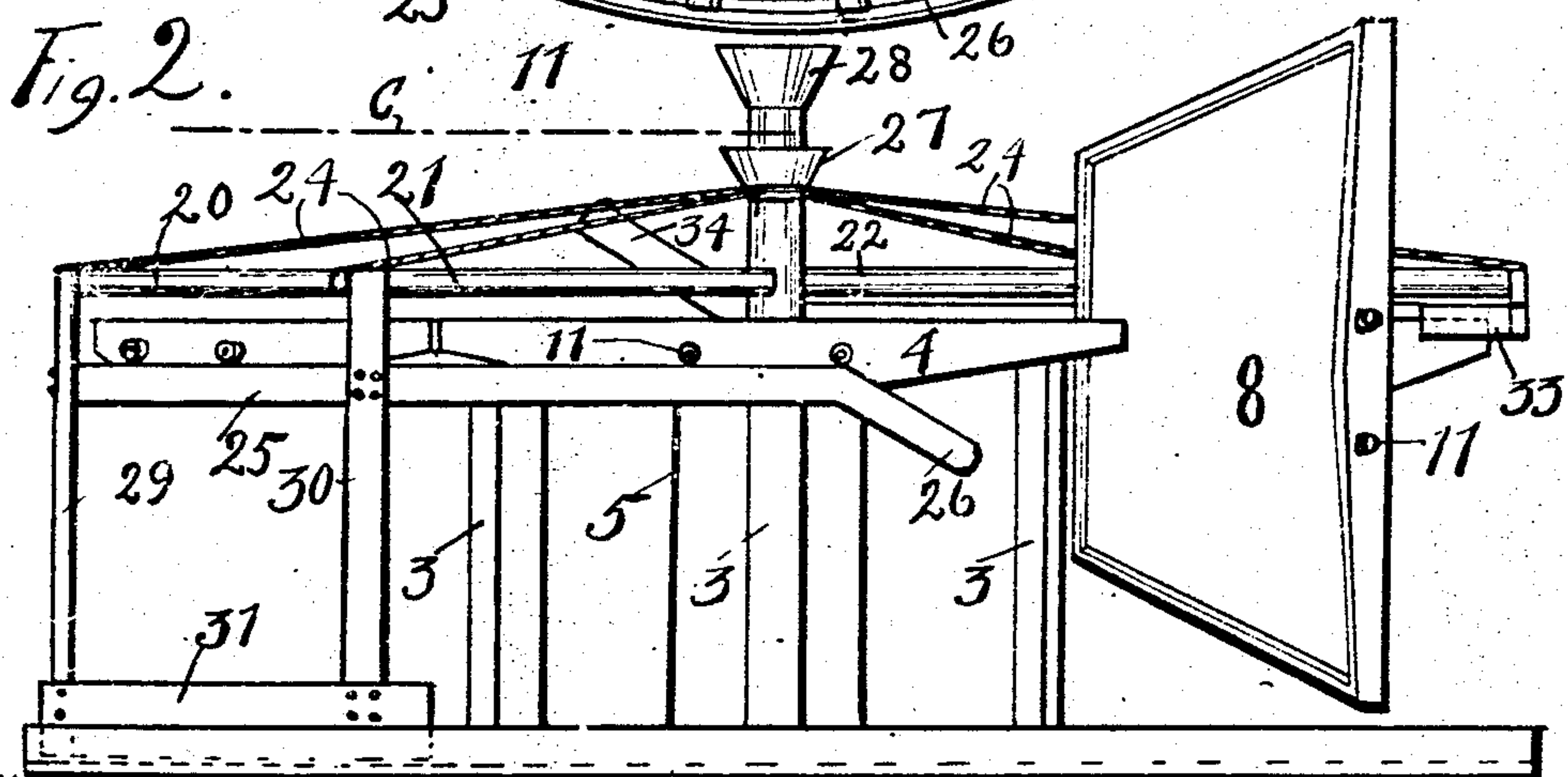
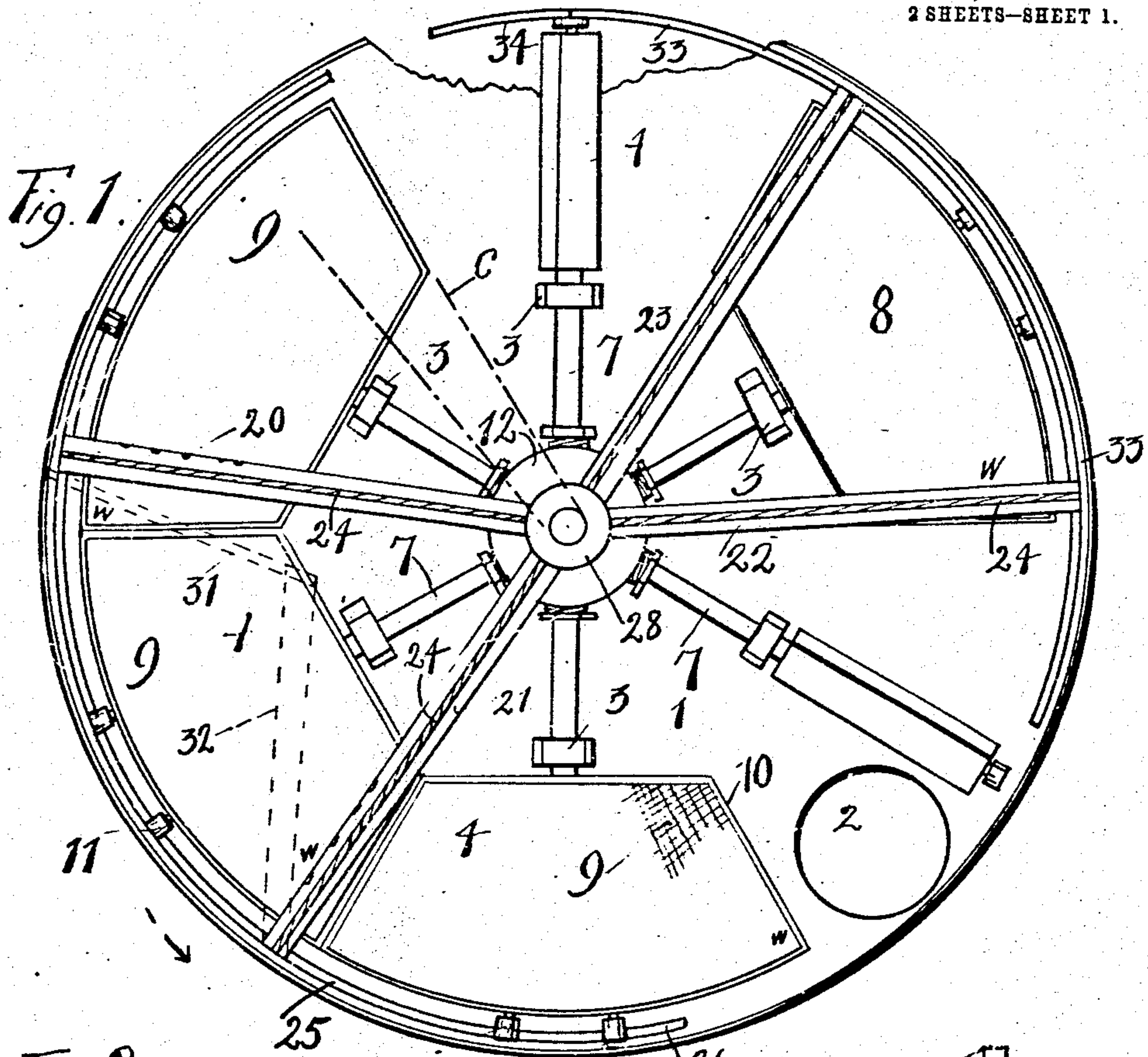
FILTER.

APPLICATION FILED SEPT. 16, 1908.

938,636.

Patented Nov. 2, 1909.

2 SHEETS—SHEET 1.



Witnesses:

*E. J. Medina*  
*Leo J. Griffin*

Inventor:

*Ralph S. Browne by*  
*Medina and Griffin Attys.*

R. S. BROWNE.  
FILTER.

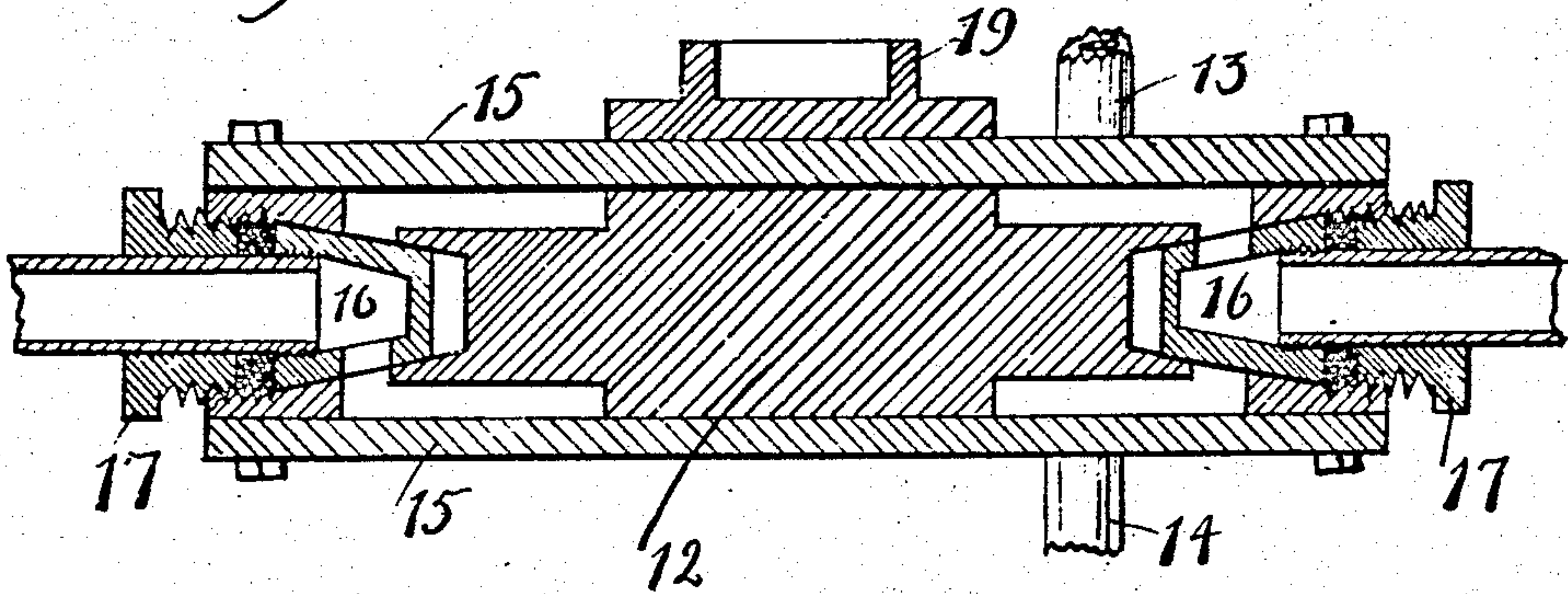
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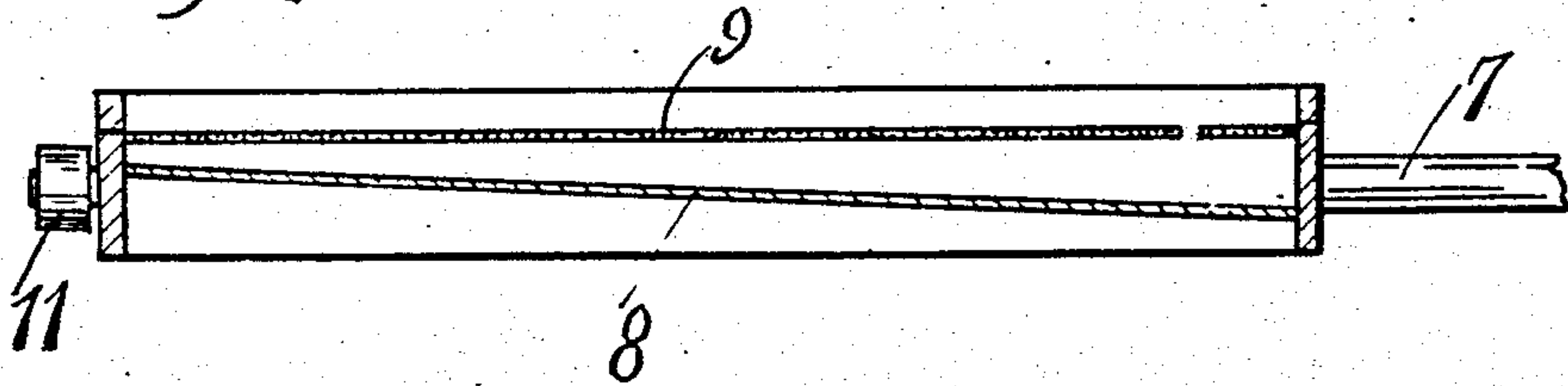
Patented Nov. 2, 1909.

2 SHEETS—SHEET 2.

*Fig. 3.*



*Fig. 4.*



Witnesses:

*E. G. Nyden*  
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# UNITED STATES PATENT OFFICE.

RALPH S. BROWNE, OF ALAMEDA, CALIFORNIA.

## FILTER.

938,636.

Specification of Letters Patent.

Patented Nov. 2, 1909.

Application filed September 16, 1908. Serial No. 453,266.

*To all whom it may concern:*

Be it known that I, RALPH S. BROWNE, a citizen of the United States, residing at Alameda, in the county of Alameda and State of California, have invented a new and useful Filter, of which the following is a specification in such full and clear terms as will enable those skilled in the art to construct and use the same.

19 This invention relates to filters used for the purpose of the purification of liquids, and its especial object is the purification of liquids from very fine slimes such as are treated in the cyanidation of gold and silver ores.

15 An object of the invention is to produce a filter which will be as nearly continuous in operation as possible, and which will require no personal supervision, all the operations being carried out by the mere operation of the machine.

20 In the drawings, in which the same numeral of reference is applied to the same portion throughout, Figure 1 is a plan view of the machine, Fig. 2 is a side elevation of the same, the only frame shown being the supporting posts, Fig. 3 is a vertical sectional view of the center bearing, and Fig. 4 is a vertical sectional view of one of the filter pans.

30 In the drawing the numeral 1 is applied to the floor which may be made of any suitable material, an opening 2 therein being provided for the discharge of the slimes after they have been treated on the filter. Rising from the floor are six posts 3, one for each filter pan 4, and a large center post 5 which supports the center bearing 6. Each of the posts 3 is provided with a cap bearing for the hollow shafts 7 of the filter pans. The filter pans are frames having the inclined bottom 8 over which is secured the filtering top 9, cleats 10 being placed around the entire outer edge of each pan. The inner side of the pan is secured permanently to the hollow shaft 7 and the outer edge of the pan is provided with two rollers 11. The hollow shafts all pass into the center bearing 12 which is secured on the top of the post 5, stuffing boxes being used to make a tight joint at the junction of said pipes and the center bearing.

55 The center bearing 12 is provided with an upper and a lower compartment, the upper being connected with an air pressure supply by means of the pipe 13 and the lower is

connected with a suction pump by means of the pipe 14. Each compartment of the center bearing is closed by means of a plate 15 on the upper of which the journal box 19 for the revoluble pipe 17 is secured. The pipes, or hollow shafts, which are secured to the inner edges of the filter pans are each provided with a conical head 16 which has a port on one side, the head being threaded 65 on the end of the pipe. This conical head fits a seat in the center bearing which has an opening into each of the compartments of the center bearing, the packing in front of the gland 17 acting to hold the cone 16 70 so closely into contact with the seat as to make a tight joint at all times.

The journal box 19 supports the pipe 27 which in turn supports the arms 20, 21, 22 and 23 cables 24 being secured to the center pipe to give greater strength to the construction. The arms 20 and 21 support the track 25 which has the downwardly inclined cam 26 at its front end, the revolution of the revoluble parts taking place in the direction 80 indicated by the arrow. The arms 20 and 21 are hollow and are for the purpose of feeding the pulp and wash water to the tops of the filter beds. The arm 21 is connected with the hopper 27 in which the slime solution is 85 fed. The arm 20 is connected with the hopper 28 into which the wash water is fed. The arms which are connected with the track 25 have the downwardly extending portions 29 and 30 which are attached to the scraper 90 31, a horizontal portion 32 connected in the bar 30 with one end of the scraper 31.

The arms 22 and 23 have the track 33 secured to them, said track having the upwardly extending cam 34 at the front end. 95 It will be understood that additional strength may be given all the arms by adding such bracing as may be found necessary and desirable.

The filter pans are balanced so that they 100 will turn down at the ends marked *w* as gently as may be found necessary, and it will be noted that there may be such number of the filter pans as may be deemed necessary to provide for handling the desired amount 105 of solution.

The operation of the device is as follows: The chain C is connected with any suitable source of power and is turned slowly, the motion being as indicated by the arrow in 110 Fig. 1, the slime solution is then fed in the hopper 27 and is allowed to run on the filter



pans through the arm 21, only enough  
 water and slime being run in to fill the pan  
 in the time it takes the arm to pass over it.  
 Water is run into the hopper 28 and onto the  
 5 pan through the arm 20, and during the  
 time the arms 20 and 21 are passing over the  
 pans the valve cone 16 is turned so that it is  
 connected with the lower chamber of the  
 center bearing. The rotation being con-  
 10 tinued the cam 26 picks up the filter pan,  
 the rollers passing up and on the track 25,  
 when the pan is held perfectly level. The  
 weighted end of the pan drops down as soon  
 as the track 25 passes out from under the  
 15 last roller, leaving the pan as shown at the  
 upper portion of Fig. 1, when the track 33  
 moves up to the rollers on the outer edge of  
 the pan, and since this track has an up-  
 wardly extending cam and since the track is  
 20 above the horizontal plane of the rollers the  
 pan is pushed over so that it is upside down,  
 as shown at the right of Fig. 1, in which po-  
 sition the valve cone 16 is in connection with  
 the upper chamber of the center bearing, see  
 25 the relative position of the two valve cones  
 in Fig. 3, where it receives air under pres-  
 sure sufficient to cause the cake of slime to  
 fall off the filter pan, the scraper 31 pushing  
 the mass which drops off the pan through the  
 30 hole 2 in the bottom of the floor 1, the rim  
 38 preventing the slime from being pushed  
 off the floor, except at the said hole.

It is to be noted that the movement of the  
 arms in their travel around the several pans  
 35 is so slow that comparatively little power is  
 required to operate the filter, and that it does  
 not require attention on the part of mill  
 tender at all, any more than to see that it  
 continues to operate.

40 Having thus described my invention what  
 I claim as new and desire to secure by Let-  
 ters Patent of the United States is as follows:

1. In a filter, the combination of a filter  
 bed, a pipe leading from said filter bed and  
 45 with which said bed is revoluble, means  
 whereby a reduced air pressure may be pro-  
 duced in said pipe when in one position,  
 means whereby an increased air pressure  
 may be produced in said pipe when in the  
 50 opposite position, and means to turn said  
 pipe and filter bed from one position to the  
 other and vice versa.

2. In a filter, a series of circularly placed  
 revoluble filters, means to invert each filter  
 55 bed successively, means to supply a solution  
 to be filtered to the beds, means to supply a  
 wash solution to the beds, and a scraper  
 adapted to deliver all the sludge dumped  
 from the beds at one place.

60 3. In a filter, a series of circularly placed  
 filters, a revoluble standard carrying sup-  
 ply pipes for solution to be filtered and  
 wash water, said pipes adapted to pass suc-

cessively over each of the filter beds, means  
 carried by the supply pipes to successively 65  
 right each filter prior to its charging, means  
 carried by the revoluble standard to invert  
 each filter bed successively, and a scraper  
 adapted to deliver all the sludge at one place.

4. In a filter, a series of circularly placed 70  
 filters, a hollow shaft supporting each filter,  
 a valve at the end of said shaft and adapted  
 to produce a partial vacuum under the filter  
 cloth when in one position and to deliver a  
 pressure of air under the filter cloth when in 75  
 the opposite position, a traveling pulp and  
 wash water feed, a revoluble track adapted  
 to contact with projections on the filter and  
 hold the same right side up, a second track  
 adapted to contact with projections on the 80  
 filter to invert the same, and means to cause  
 the travel of the feeding devices and the  
 tracks.

5. In a filter, a series of circularly placed 85  
 filters, a hollow shaft supporting each filter,  
 a valve at the end of the shaft and adapted  
 to produce a partial vacuum under the filter  
 cloth during one stage and to deliver a pres-  
 sure of air under the cloth at another stage,  
 a pulp and wash water feed, a revoluble track 90  
 adapted to contact with projections on each  
 filter in succession to hold them upright, a  
 second revoluble track adapted to contact  
 with projections on each filter to invert them  
 in succession, and means to drive the two 95  
 tracks.

6. In a filter, a series of circularly placed  
 filters, a hollow shaft supporting each filter,  
 a valve at the end of the shaft and adapted  
 to produce a partial vacuum under the filter 100  
 cloth during one stage and to deliver a pres-  
 sure of air under the same at another stage,  
 a pulp and wash water feed, a revoluble  
 track supported near the outer edge of each  
 filter and adapted to contact with projec- 105  
 tions on each filter to hold the same upright,  
 a second revoluble track adapted to contact  
 with the filters in succession to invert them,  
 and means to operate the movable tracks.

7. In a filter, the combination of a series 110  
 of revoluble filters, a hollow shaft support-  
 ing each filter, a movable track adapted to  
 hold each filter right side up by contacting  
 with projections on each filter, a second mov-  
 able track in a higher plane and following 115  
 the first track and adapted to invert the fil-  
 ters in succession, and means to drive the  
 tracks.

In testimony whereof I have set my hand  
 this 11 day of September A. D. 1908, in the 120  
 presence of the two subscribed witnesses.

RALPH S. BROWNE.

Witnesses:

C. P. GRIFFIN,  
 W. T. HESS.