No. 877,182. PATENTED JAN. 21, 1908.

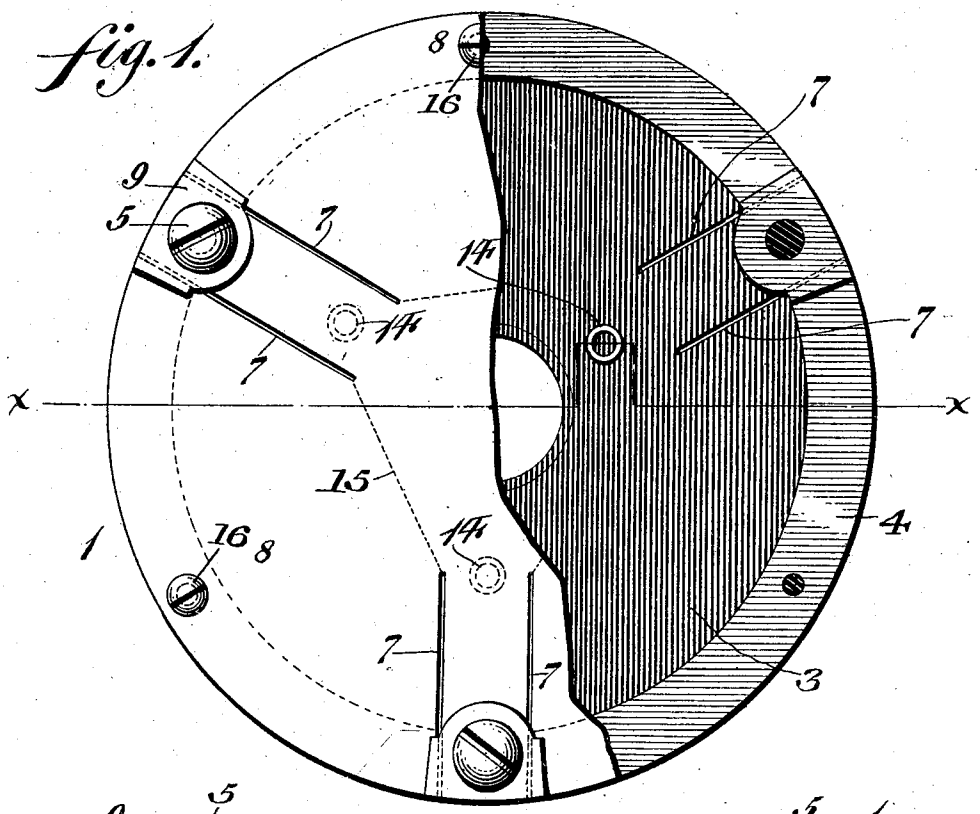
J. R. & H. D. ELFRETH.

SAND OR STRAINER VALVE FOR FILTERS.

APPLICATION FILED JULY 9, 1907.

2 SHEETS—SHEET 1.

fig. 1.



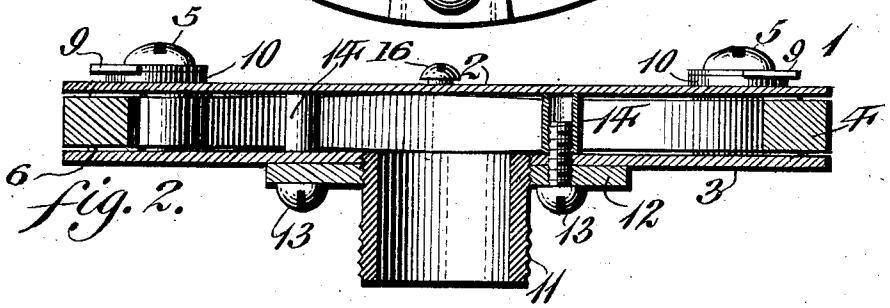


fig. 2.

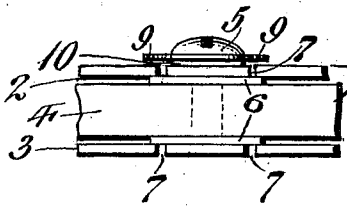


fig. 3.

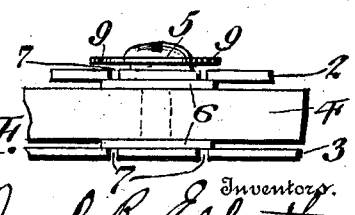


fig. 4.

Witnesses

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2 SHEETS—SHEET 2.

Fig. 5.

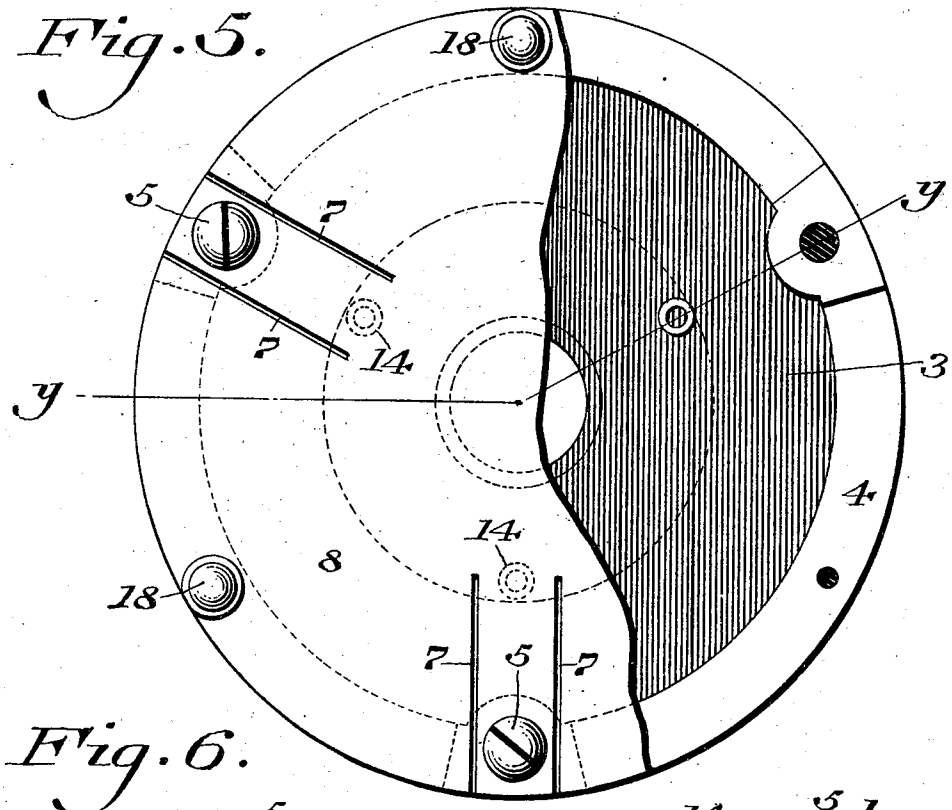


Fig. 6.

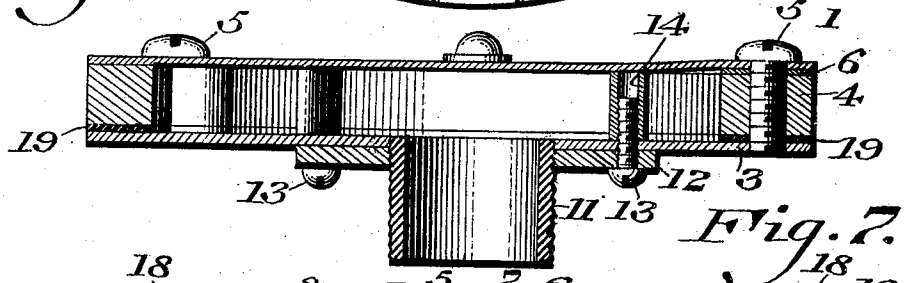


Fig. 7.

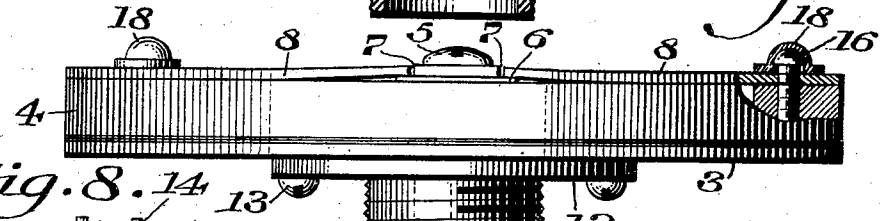
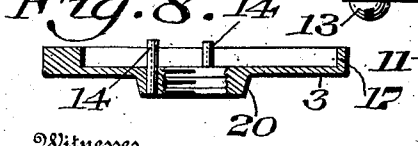


Fig. 8.



Witnesses

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UNITED STATES PATENT OFFICE.

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SAND OR STRAINER VALVE FOR FILTERS.

No. 877,182. Specification of Letters Patent. Patented Jan. 21, 1908.

Application filed July 9, 1907. Serial No. 382,876.

To all whom it may concern:

Be it known that we, JACOB R. ELFRETH and HAROLD D. ELFRETH, both citizens of the United States, and residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Sand or Strainer Valve for a Filter, of which the following is a specification.

Our invention relates to a new and useful filter and consists of a sand valve therefor which is provided with means for preventing breakage of the movable parts of the same.

It further consists of a new and useful means for supporting the top plate of the valve.

It further consists of novel details of construction all as will be hereinafter fully set forth.

Figure 1 represents a top plan view of a a sand valve embodying our invention with a portion of the top plate broken away. Fig. 2 represents a sectional view on line *x—x*, Fig. 1. Fig. 3 represents a side elevation of a portion of the device. Fig. 4 represents a side elevation showing a form of protector or stop which may be employed. Fig. 5 represents a top plan view of a sand valve of slightly different construction, showing a portion broken away. Fig. 6 represents a sectional view on line *y—y*, Fig. 5. Fig. 7 represents a side elevation thereof with a portion broken away. Fig. 8 represents a sectional view showing a form in which the lower plate can be made.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings: We have found in practice in sand valves now employed in filters of the form similar to that shown in Letters Patent No. 707,333, that the wings, flaps or valves are apt to be broken away or the top plate bent by reason of the alternate opening and closing of the port in operation and the pressure of the water in its passage through the valve, and we have further found that by reason of the weight of the sand which is necessarily superimposed upon the valve, as well as by the reaction of the ports or wings in operation of washing, that the top plate is in many instances concaved and in others entirely broken down, thus rendering the sand valve incapable of proper operation and in some instances entirely destroying the valve.

Our present invention is designed to overcome this defect and while we have shown in the drawings a form for carrying out the same, it will be evident that the arrangement of the parts may be altered and other instrumentalities may be employed, which will accomplish the same result and we do not therefore, desire to be limited in every instance to the exact construction as herein shown and described.

In the drawings we have shown a construction of the valve proper similar to that shown in the Patent No. 707,333, patented August 19, 1902, it being understood that the sand valve in the present instance is designed and arranged to be used in the same manner as that shown in the said patent or in any other desired manner.

1 designates a sand valve consisting of a body comprising respectively top and bottom plates 2 and 3 of any suitable material and between these plates is the side wall of said body, the same consisting of a ring or annulus 4 to which the plates 2 and 3 are suitably attached, in the present instance by means of the screws 5. Between the plates and ring, preferably at the place where the same are secured together, are washers 6 which hold the plates a slight distance away from the ring, forming spaces or ports between the same. In the plates are the cuts, slits or other suitable means, as at 7, which extend from the periphery towards the center in such a manner as to leave portions of the plates movable, said portions forming flaps or valves 8 which are adapted to be automatically raised and lowered as the water flows in either direction, it being noted that the screws 5 pass through the narrow portion of the plates between the slots or cuts 7 as best understood from Fig. 1. Carried by or held in place by screws 5 are the stops 9, the same being wider than that portion of the plate which is engaged by the screws 5 so that the said stops 9 project over the flaps or valves 8, that is to say, the said stops project beyond the slits or cuts 7 and form an overhang for the said valve 8, attention being called to the fact that the said stops 9 are so supported with respect to the said valves 8 as to be normally situated a slight distance above the same, this being clearly seen in Figs. 2, 3 and 4. It will be seen from the above that as the valves or flaps 8 are raised, the same can be moved only a distance equal to that between the said valves and the stops 9, since the edges of the plates will contact with the overhang of said stops and will pre-

vent further upward movement. It will be seen that in this way too great a strain is prevented upon the valves or flaps so that bending or breaking of the same is prevented, since we have found, as before stated, in practice that where there are no stops to prevent the upward movement of the valves that, owing to the inner ends of the cuts 7 being substantially close, there is a bending and possible cracking of the flaps or valves near the center as shown in dotted lines, Fig. 1 at 15, which render the same useless.

In order to prevent the valves or flaps from being elevated too much, at a point between the slits 7, we provide the headed pins or screws 16, the heads of which are located at a suitable point above the normal position of the valves or flaps 8 and allow only a predetermined movement.

In Fig. 3 we have shown the stop 9 in the form of a plate with a separator or spacer 10 between it and the top plate 2, and in Fig. 4, we have shown the stop and separator formed integral, the effect of which is evident. Carried by the bottom plate 3 is the pipe or nipple 11 which also engages with the annulus or disk 12, the same being secured to the bottom plate 3 by the screws 13 and we have shown connected with the bottom plate by means of the screws 13, the pillars 14, the same being in the present instance three in number and being situated at equal distances around the center of the top plate 2, which is adapted to rest thereon, it being seen that in this way we support the top plate 2 at suitable distances, in order to prevent the same from being broken or bent in by reason of the weight of the sand which is superimposed upon the said valve or by the reaction of the flaps when under pressure. It will be seen that while we have shown the pillars 14 in the form of hollow tubes that the same can be made integral with the plate 3 if desired or in any suitable manner and that any desired number of these pillars may be made to support the plates which may be necessary.

It will be further apparent that the valves 8 may be formed in any desired manner, shape, number or size, it being only necessary to limit the upward movement thereof.

In the construction shown in Figs. 5 to 7, we provide the pins or screws 16 to limit the movement of the flaps 8 and over the heads of said pins we fasten the protector or cap 18, which may be secured to the valve or flap in any desired manner and moves therewith, said cap serving to protect the screws and preventing the lodgment of sand between the head thereof and the valves. We further dispense with the slits 7 in the lower plate and place the packing 19 between the ring 4 and the lower plate, thus making a perfect joint therebetween and preventing leaking, this construction acting the same as if the ring and lower plate were made in one piece, which can be done if desired. This latter construction we have shown in Fig. 8 in which the bottom plate 3 is made with the integral rim 17 serving as the annulus or ring 4, and with the boss 20 taking the place of the disk 12. In this construction the pillars or supports 14 are tapped into the bottom plate 3 as far as may be necessary.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is:—

1. In a device of the character described, a body, movable valves thereon, spacing devices between the top and bottom of said body and a stop for said valves to limit the movement thereof.

2. In a device of the character described, a body consisting of top and bottom plates, and a side wall, spacing devices between the top and bottom plates, movable valves formed in said top plate, and stops projecting over said valves and limiting the movement thereof.

3. In a device of the character described, a body consisting of top and bottom plates, spacing devices between the top and bottom plates, ports therebetween, a valve controlling said ports, and stops for limiting the movement of said valve.

4. In a device of the character described, a body portion consisting of top and bottom plates, spacing devices between the top and bottom plates and side walls, a portion of said top plate serving as a movable valve, and a stop for said valved portion limiting the movement thereof.

5. In a device of the character described, a body having a top plate, pillars for supporting the same a side wall, a port between said wall and plate, said plate being movable in part as a valve, and a stop for limiting the upward movement of said valve.

6. In a device of the character described, a body formed of a top plate, a side wall, a bottom plate, said plate being movable in part as a valve, and pillars carried by said bottom plate and upon which said upper plate is adapted to rest.

7. In a device of the character described, a body formed of top and bottom plates and side walls, movable valves on said top, a nipple connected with the bottom plate, and means for separating the top and bottom plates intermediate the side walls.

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