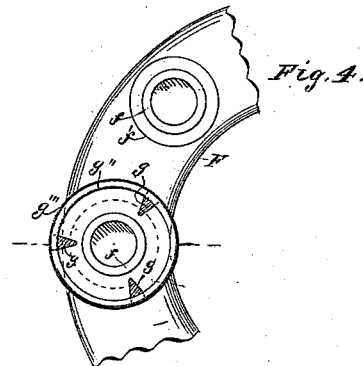
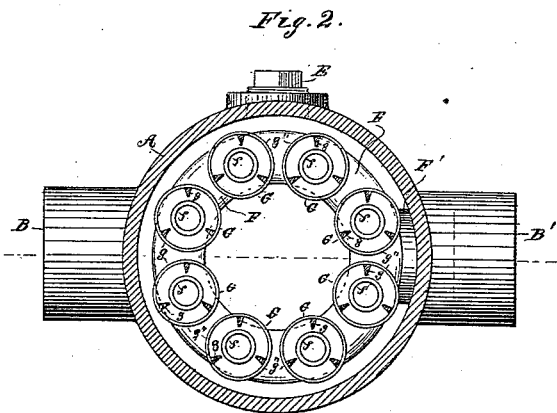
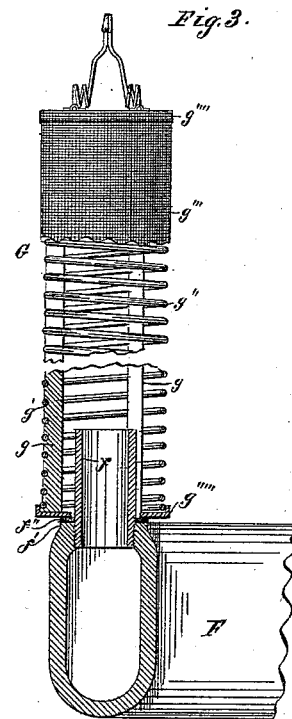
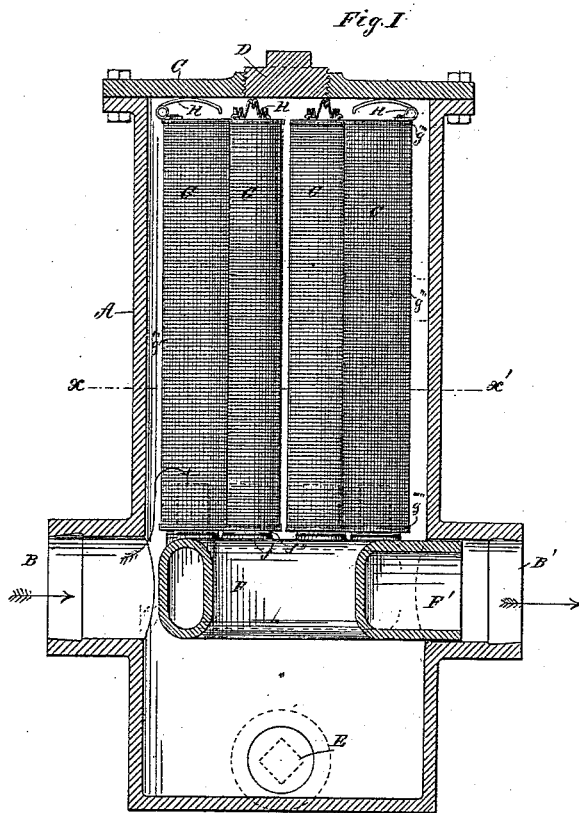


(No Model.)

J. F. WILLIS.  
WATER STRAINER.

No. 420,136.

Patented Jan. 28, 1890.



Witnesses  
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# UNITED STATES PATENT OFFICE.

JOHN F. WILLIS, OF MINNEAPOLIS, MINNESOTA.

## WATER-STRAINER.

SPECIFICATION forming part of Letters Patent No. 420,136, dated January 28, 1890.

Application filed March 14, 1889. Serial No. 303,228. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN F. WILLIS, a citizen of the United States, and a resident of the city of Minneapolis, county of Hennepin, State of Minnesota, have invented a certain new and useful Improvement in Water-Strainers, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to water-strainers; and it has for its object to provide a straining apparatus of variable capacity, adapted to remove from water all foreign matter not held in solution, the parts of which are readily removable for cleansing or other purposes, and are of a construction adapted to withstand heavy pressure and rough usage.

To this end my invention may be briefly outlined as consisting of a closed outer shell or case constituting a receiving-chamber adapted for connection to a water-main or supply-pipe, an interior receptacle located within the outer case and above the floor of the same, having one or more inflow pipes or openings on its upper surface, surrounded by strainer-seats and an outflow-pipe through the wall of the outer shell, and a series of removable strainers adapted to rest on said seats and strain the water in its passage from the outer to the inner receptacle. Each strainer is independent of every other, and is held in position on its seat by spring-tension. The top of the outer case is provided with a removable plug for access to its interior. Any strainer can therefore be readily removed without disturbing the others.

The strainers are of a special construction, adapting them to withstand the heavy pressure to which they are liable to be subjected when the apparatus is connected to city water-mains.

Great difficulty has hitherto been found in obtaining a strainer which would not collapse when the straining-cloth became filled. I accomplish this end by constructing the strainer of a set of longitudinal supports, a cylinder of spirally-arranged strong wire rigidly secured to said supports, a covering of strainer-cloth secured to the spiral-wire cylinder, and caps at the opposite ends of the cylinder, one of which is provided with

an annular central opening adapting the strainer to fit over the inflow-pipes to the interior receptacle. The vertical stays or supports for the spiral cylinder are preferably provided with spiral grooves or seats for the wire of the spiral-wire cylinder, and when the parts are in position they are galvanized together, thus making a very rigid and strong construction.

The accompanying drawings illustrate the invention, wherein, like letters referring to like parts throughout, Figure 1 is a vertical section of the entire apparatus. Fig. 2 is a horizontal section on the line X X' of Fig. 1. Fig. 3 is a view, partly in section and partly in elevation, of one of the strainers and the interior receptacle detached, some of the parts being broken away; and Fig. 4 is a plan view of a part of the interior receptacle, representing one of the strainers in position.

A is the exterior case, having right-angle extensions B for connection with the water-supply main on one side, and a similar extension B' on the other for connection with an outflow-pipe.

C is a removable cap-plate adapted to be secured by bolts or otherwise to the top of the case for closing the same.

D is the removable plug for closing the annular central opening in this cap-plate.

E is a removable plug closing and opening near the bottom of the case for removing the deposits in the same.

F is the interior receptacle, which is preferably annular in form, and may be supported in any suitable way above the floor of the outer case. As shown, it is held in position by its outflow-pipe F', which closely fits and forms a tight joint with the outer extension B' of the outer case.

f are the inflow-pipes projecting from the top surface of the receptacle F.

f' are slightly-raised annular shoulders surrounding the inflow-pipes and constituting seats for the strainers.

f'' is a gasket or packing, of rubber or other suitable material, resting upon the seats f'.

G are the strainers.

g are the vertical supports, provided with spiral grooves or wire seats g'. g'' is the

spiral-wire cylinder surrounding these supports and galvanized thereto.

$g'''$  is the covering of wire-cloth secured to the spiral-wire cylinder.

5  $g''''$  is the upper cap, and  $g'''''$  the lower cap, of the cylinder. The opening in the lower cap-plate is of greater diameter than the diameter of the inflow-pipe  $f$ . The cylinder fits over the inflow-pipe and the lower  
10 cap-plate rests on the gasket  $f''$ , thus forming a water-tight joint with the receptacle  $F$ .  $H$  is the spring for holding the cylinder in position. It is secured to the top of the upper cap  $g''''$  and is free at its upper end. When  
15 placed in position, the spring is bent down and bears against the cap-plate  $C$ , as shown in Fig. 1.

The size of the outer and interior receptacles and the number of strainers used will  
20 vary according to the capacity required.

The operation is evident from the description. Water comes into the outer case through the inflow-pipe  $B$  and is strained in its passage through the strainers  $G$ . The strained  
25 water passes out through the outflow-pipe  $F'$ . Such of the foreign matter as does not fall to the bottom of the outer receptacle by its own weight is caught on the outside of the strainer's cloth. Whenever the strainers become  
30 clogged, all that is necessary in order to clean them is to remove the plug  $D$ , press down the spring  $H$ , and lift out the cylinder, one at a time. The difference in the diameter of the lower cap  $g'''''$  of the strainer-cylinder and  
35 inflow-pipe  $f$  of the interior receptacle allows necessary lateral movement for this purpose.

This apparatus is particularly well adapted to remove from the water sawdust and similar floating material. It should, however, be  
40 noted that the relative location of the different parts is such as to afford a settling-chamber in the lower end of the outer case for catching the mud and sand and other heavy sediment.

45 What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. In water-straining apparatus, a strainer consisting of grooved supporting-rods, a wire  
50 cylinder the coils of which are rigidly secured in the grooves of said rods, and a covering of straining material attached to said cylinder, substantially as set forth.

2. In water-straining apparatus, a strainer consisting of supporting-rods provided with  
55 spiral grooves, a spiral-wire cylinder the coils of which are galvanized in said grooves, and a covering of wire-cloth attached to said cylinder, substantially as set forth.

3. In water-straining apparatus, the combination, with a receiving-case, of an independent interior receptacle having an outflow-pipe through the wall of the outer case and serving to support the receptacle therein, one or more independent removable strainers  
60 mounted on said interior receptacle and in communication therewith, and a pressure device for retaining each strainer in position on its seat, substantially as described.

4. The combination, with a receiving-case  
70 having its inflow-pipe above the level of its bottom, of an interior receptacle supported above the bottom, having an outflow-pipe through the wall of the outer case and provided with a series of vertical inflow-pipes, a  
75 series of strainers fitting over said inflow-pipes and resting on packed seats surrounding the same, springs on the top of said strainers, bearing against the end of the outer case for retaining them in position, and a removable plug in the end of the case, substantially as described.

5. The combination, with the outer vertical case having a removable plug in its upper end, of the independent interior horizontal outflow-receptacle therein, having a series of inflow-pipes with surrounding strainer-seats on its upper surface, and a corresponding series of independent strainers having  
85 openings in their lower cap-plates of larger diameter than said vertical inflow-pipe, adapted to fit over said pipes and rest upon said seats, whereby the strainers may be tilted at their tops as is required for removal, substantially as described.

6. In a water-straining apparatus, a strainer consisting of grooved supporting-rods, a wire cylinder surrounding said rods and secured in the grooves thereof, a covering of straining material attached to said cylinder, and a  
90 cap-plate at each end of said cylinder, substantially as set forth.

JOHN F. WILLIS.

In presence of—

JAS. F. WILLIAMSON,  
EMMA F. ELMORE.