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J. F. ZIEGLER.

FILTER.

No. 565,250. Patented Aug. 4, 1896.

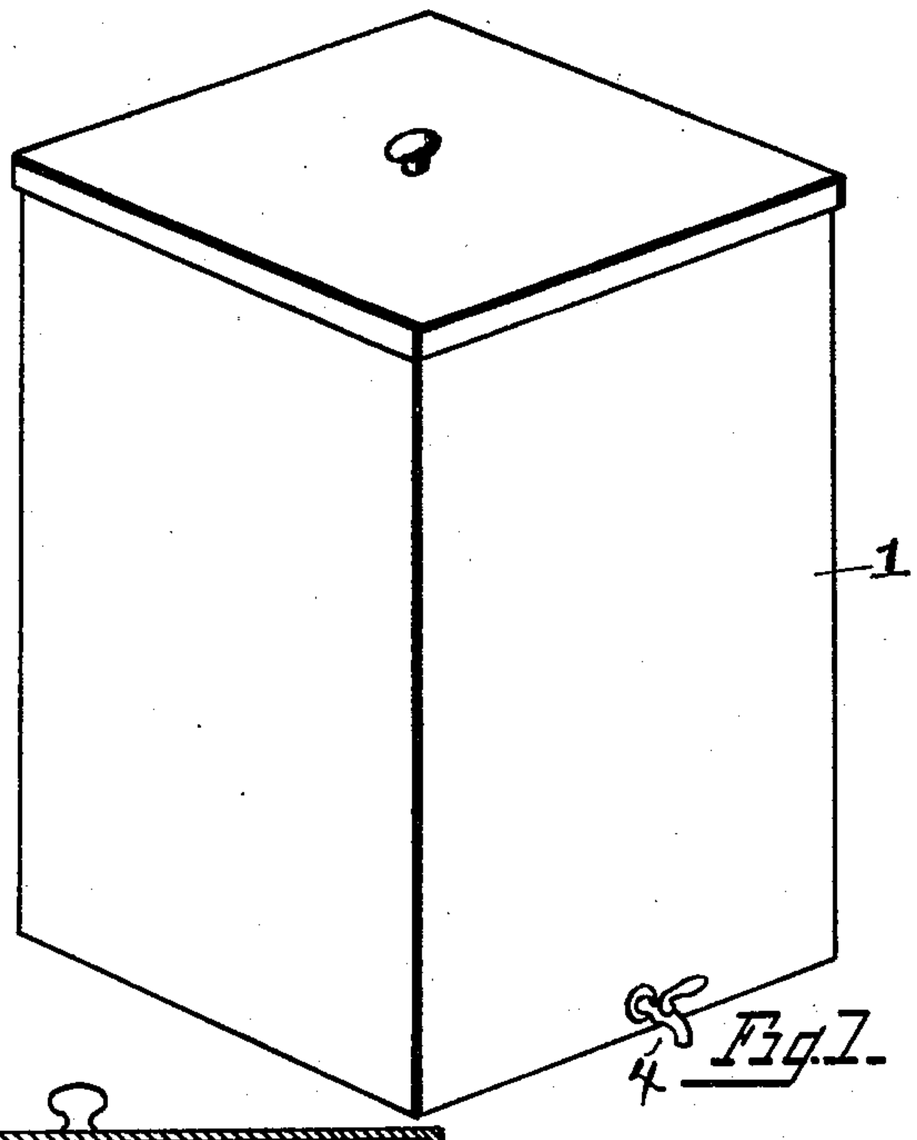

Fig. 1.

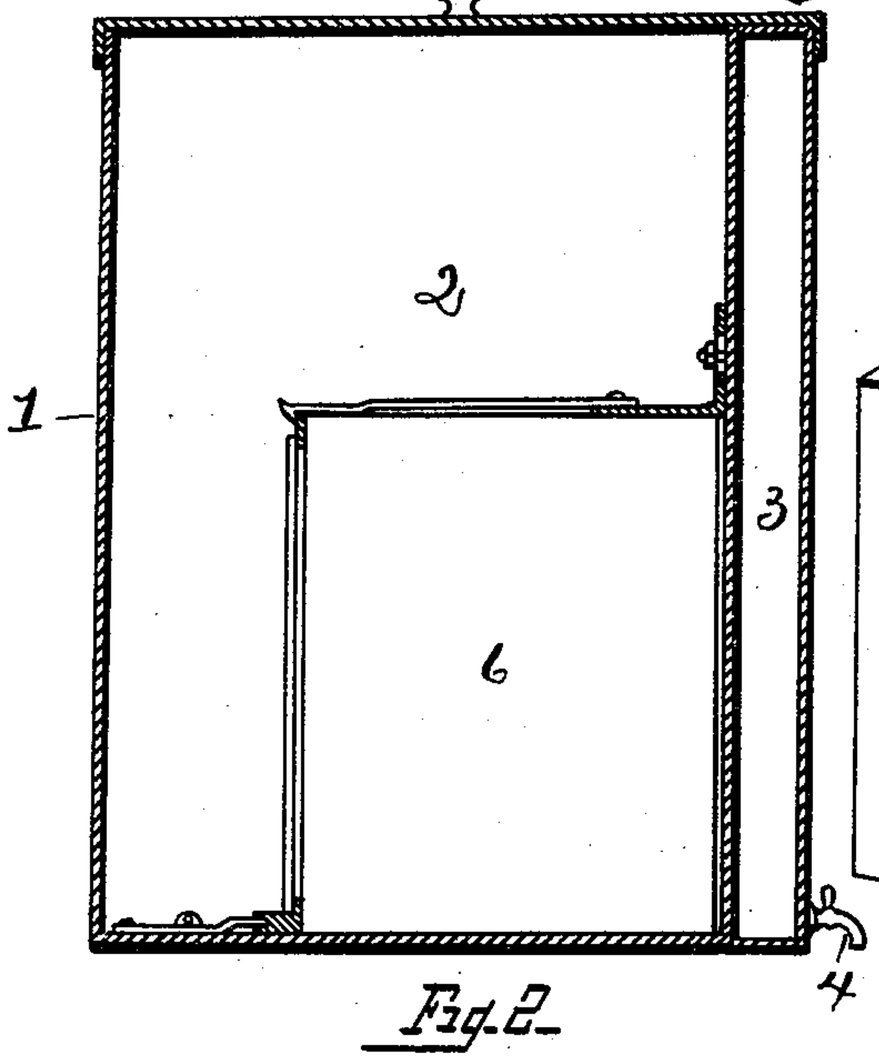

Fig. 2.

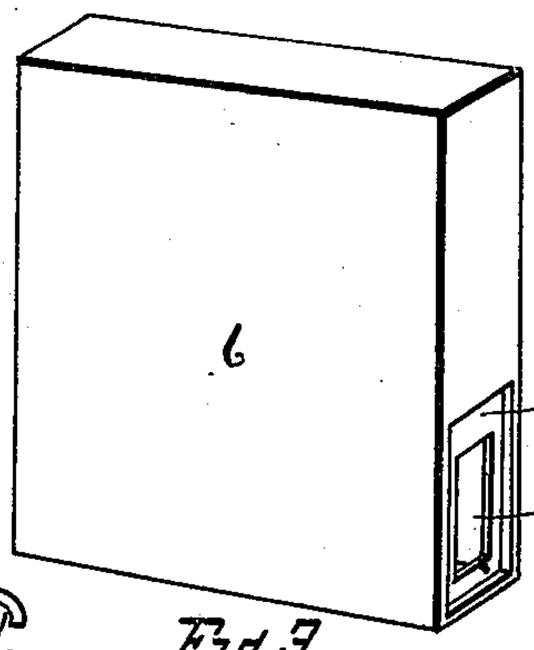

Fig. 3.

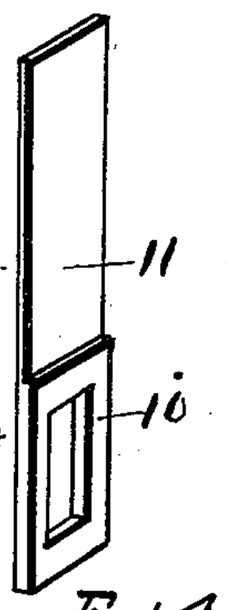

Fig. 4.

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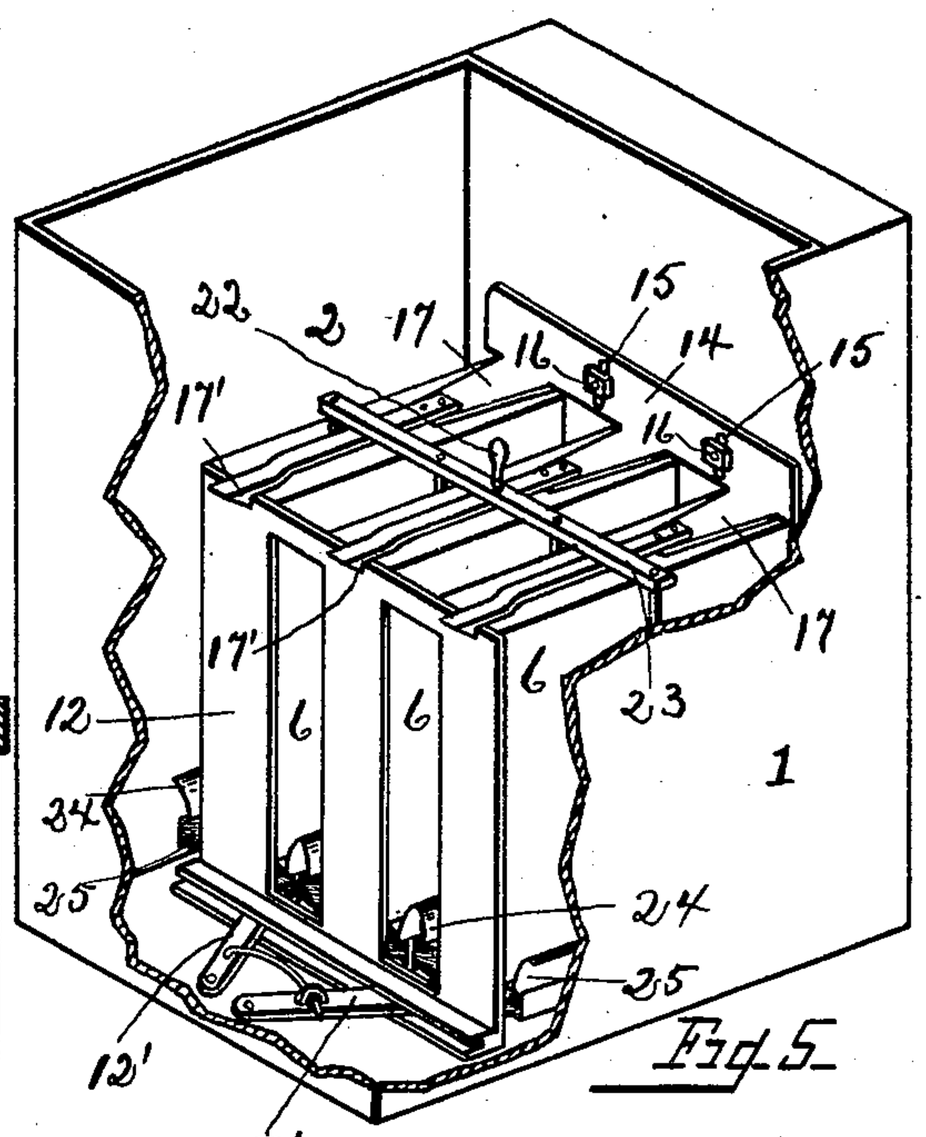

Fig. 5.

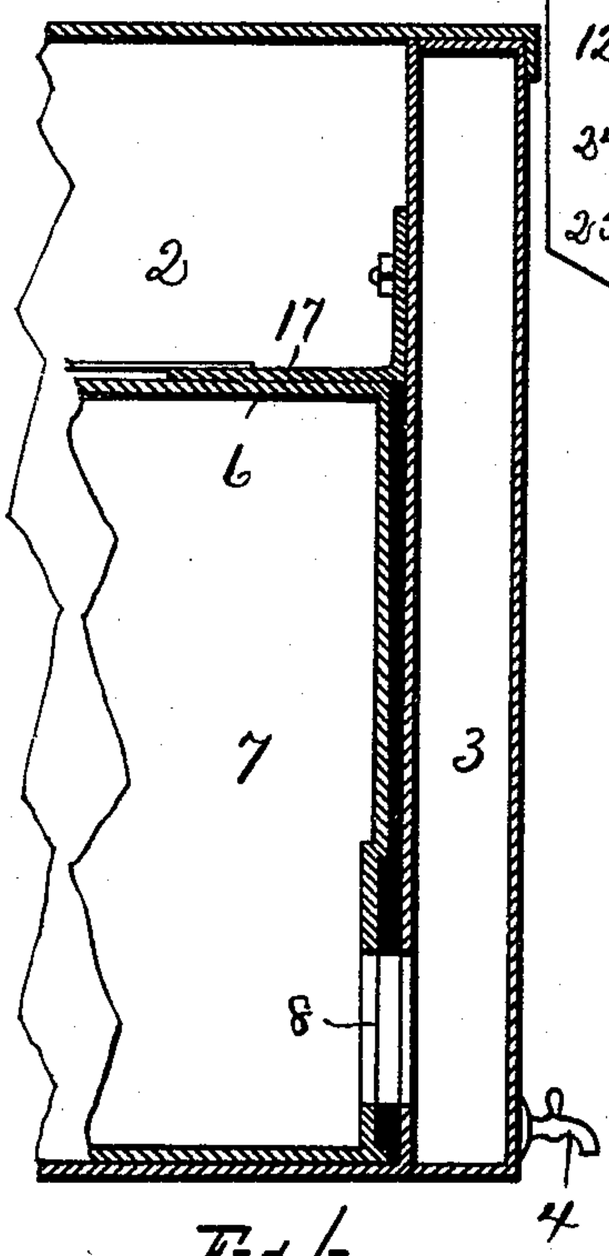

Fig. 6.

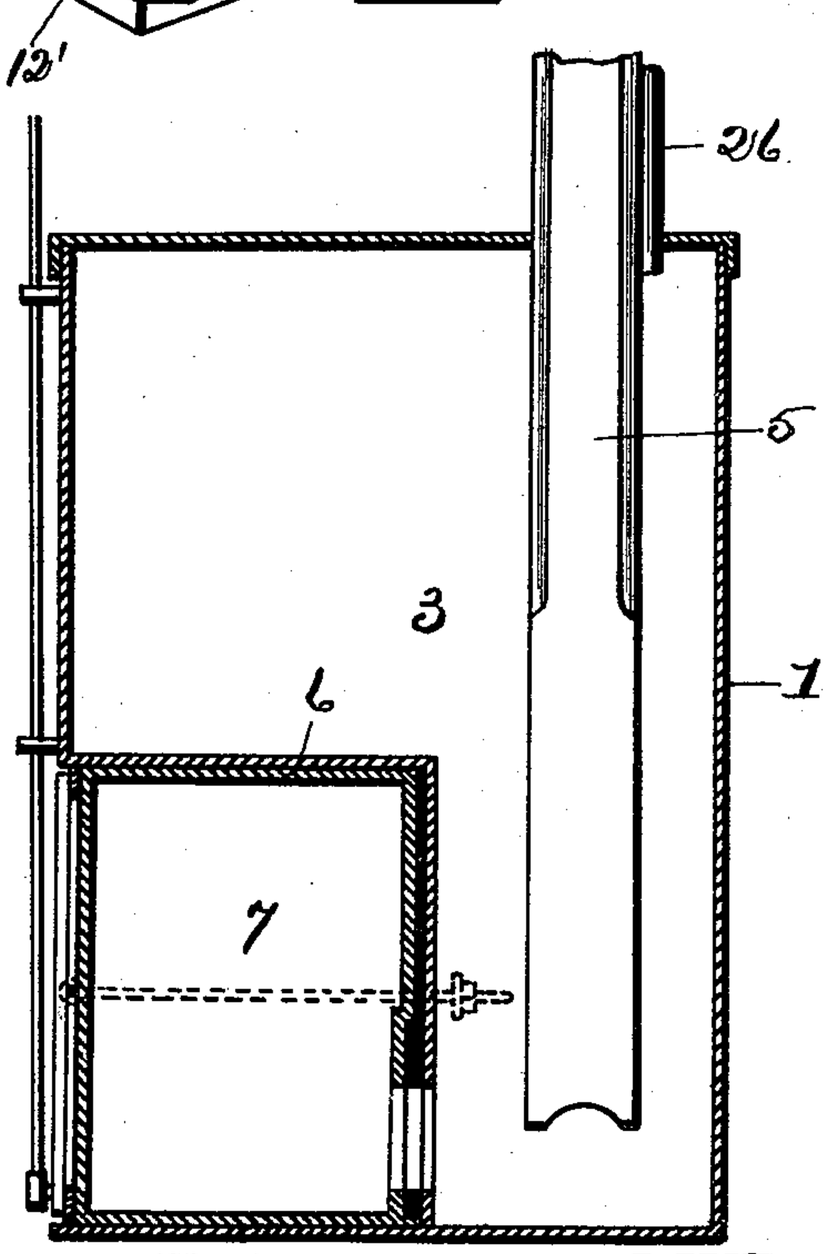

Fig. 7.

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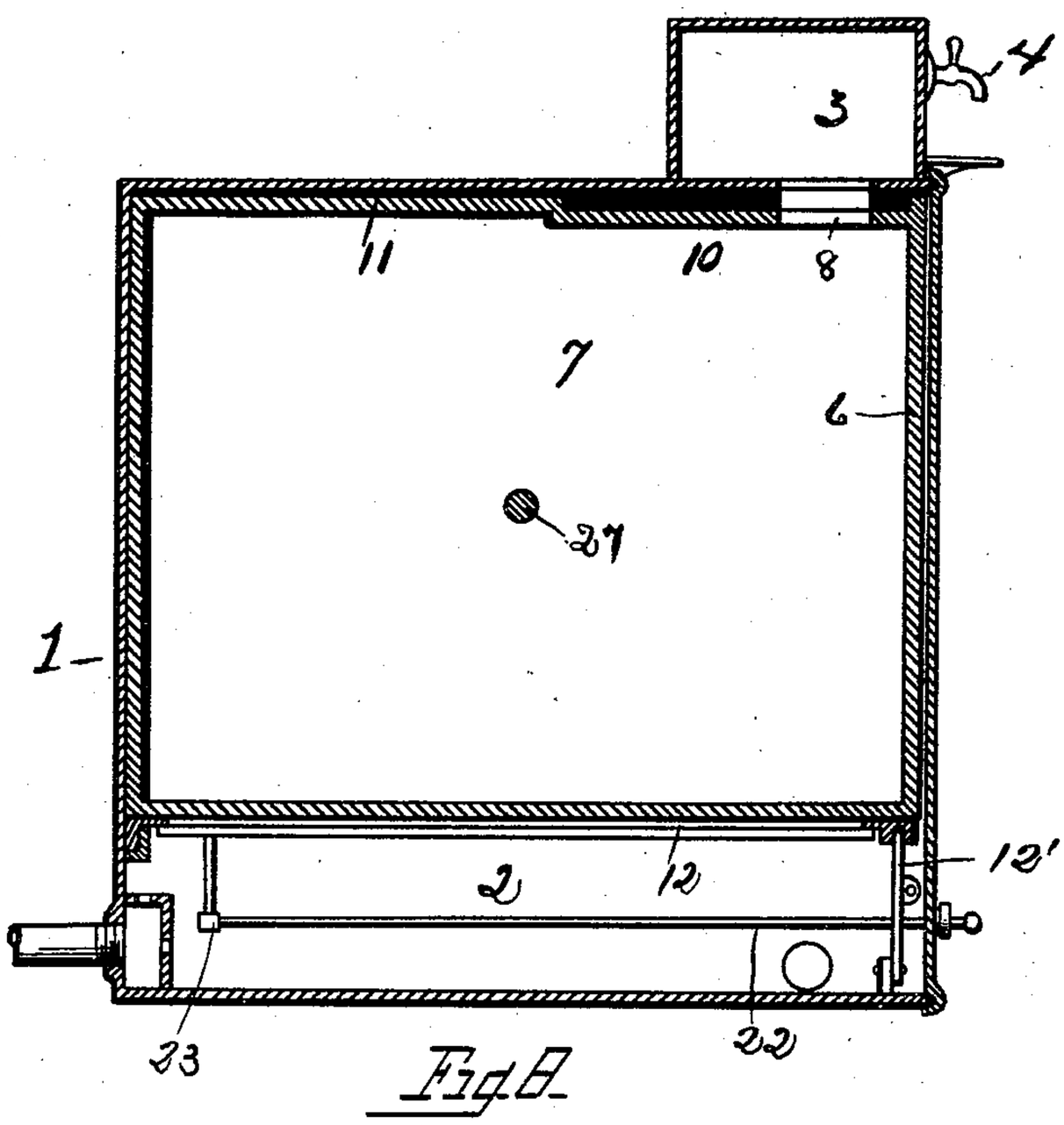

Fig. 8.

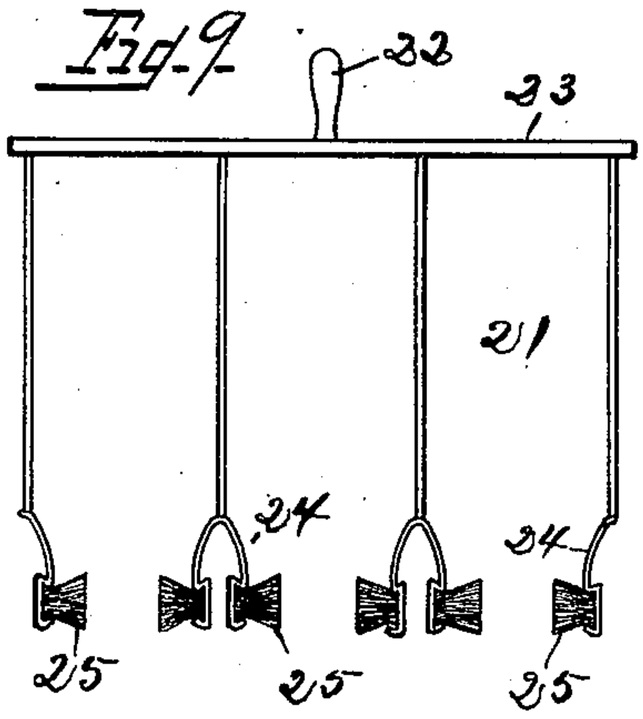

Fig. 9.

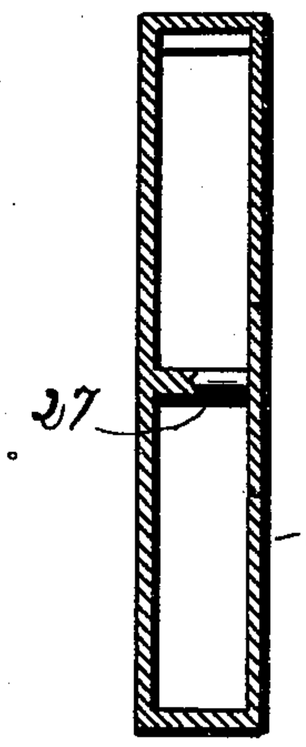

Fig. 11.

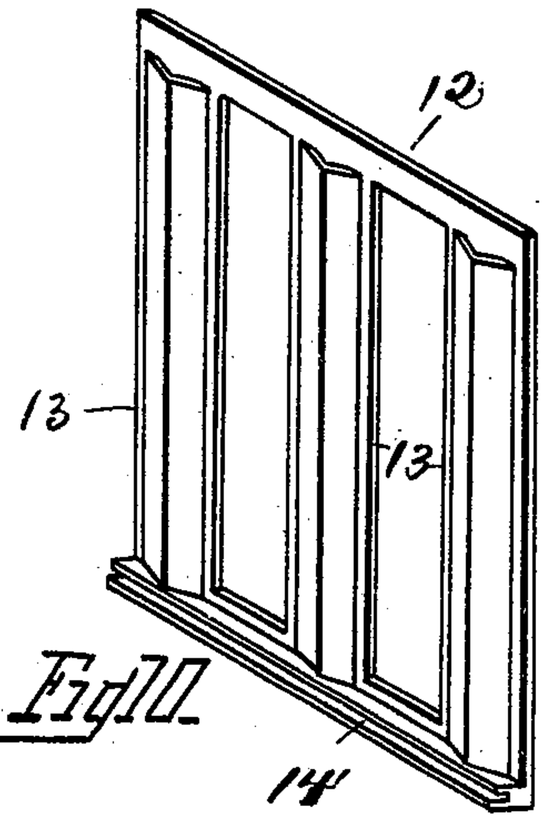

Fig. 10.

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FILTER.

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Fig 12.

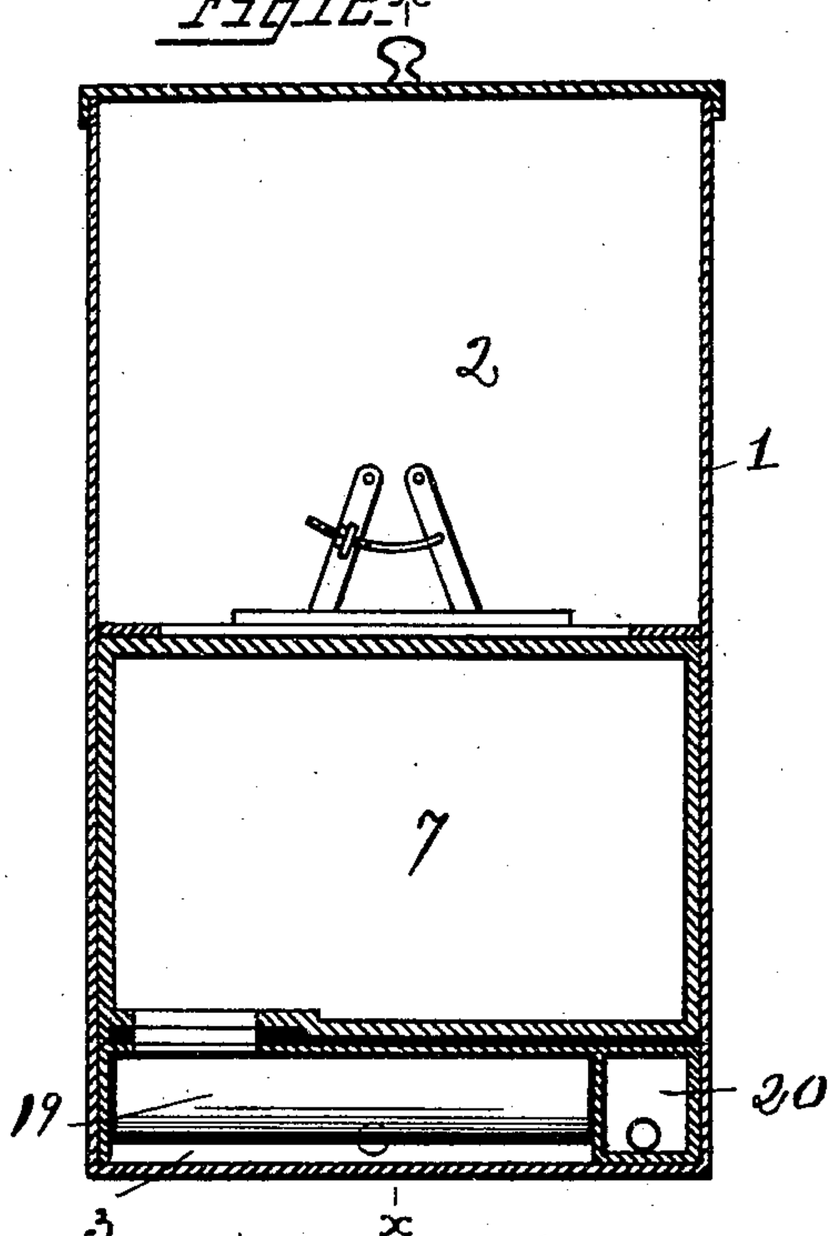
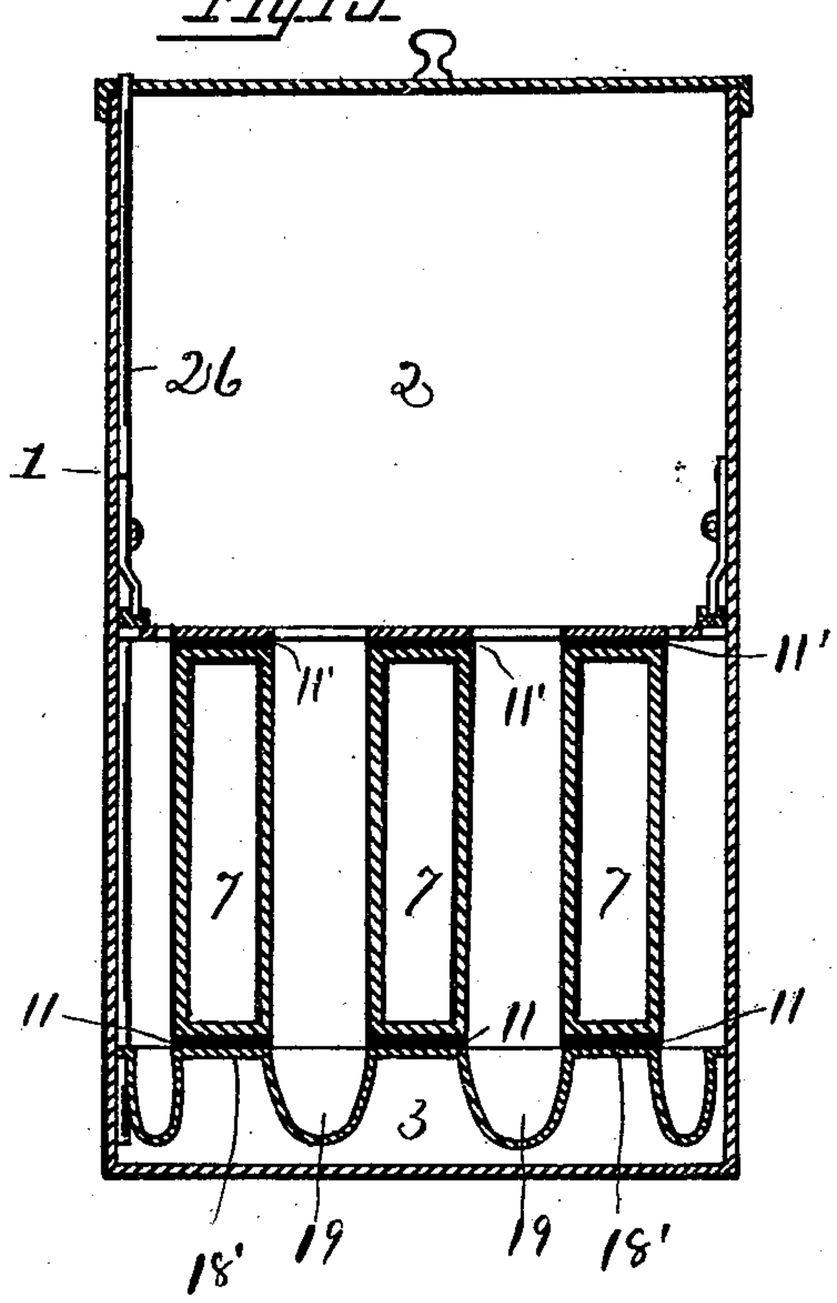


Fig 13.



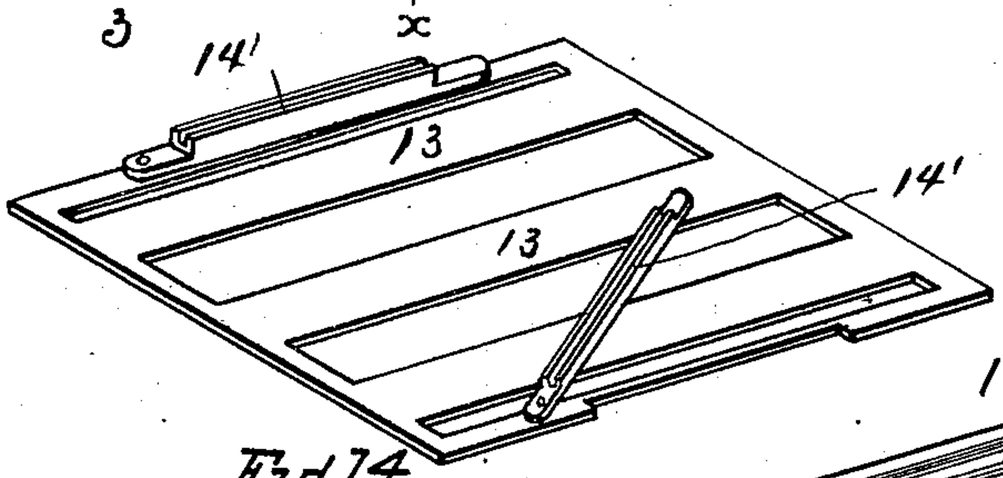


Fig 14.

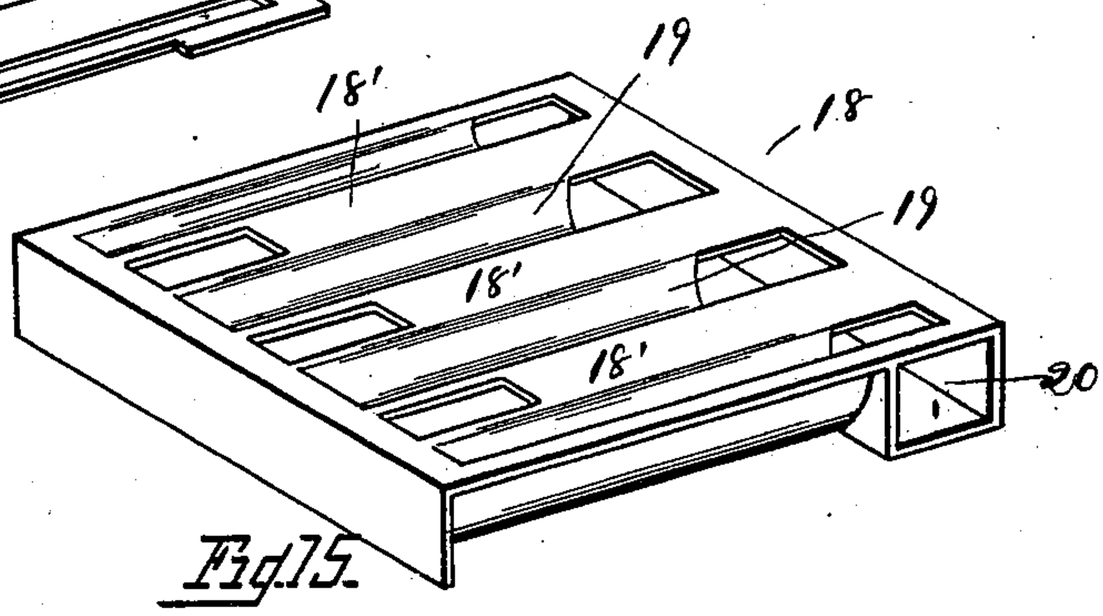


Fig 15.

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UNITED STATES PATENT OFFICE.

JOHN F. ZIEGLER, OF TOLEDO, OHIO.

FILTER.

SPECIFICATION forming part of Letters Patent No. 565,250, dated August 4, 1896.

Application filed December 28, 1893. Serial No. 494,989. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. ZIEGLER, of Toledo, county of Lucas, and State of Ohio, have invented certain new and useful Improvements in Filters; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form part of this specification.

My invention relates to filters, and has for its object to provide a large area of filtering-surface with a small filter-chamber, with convenient means for cleaning the filter and disposing of the debris.

A further object is to provide for economy of construction and convenience of assemblage of the parts.

The invention consists of the parts and combination of parts hereinafter described, and pointed out in the claims.

In the drawings I have illustrated my invention as applied to the several forms of filters demanded by the trade, in which—

Figure 1 is a perspective view of a filter designed for ordinary family use, either in reduced size to be placed in the water-receptacle of an ordinary refrigerator or of larger size for general domestic purposes. Fig. 2 is a sectional elevation of the same. Fig. 3 is a perspective view of one of the interiorly-chambered filtering-blocks. Fig. 4 is a rear elevation of one of the compressible cushions. Fig. 5 is an elevation of the construction shown in Fig. 1, with the cover removed and the casing broken away to disclose the filtering-blocks in position and the mechanism for holding them in place, with the cleaner in operative position. Fig. 6 is a sectional elevation of the same, showing the chamber for filtered water and the opening in the filtering-blocks through which the water passes to the chamber. Fig. 7 is a sectional elevation of a well or cistern filter in which the present invention is employed. Fig. 8 is a like view of a pressure-filter. Fig. 9 is an elevation of the cleaner employed for cleaning the sedimentary deposit upon the filtering-blocks. Fig. 10 is a transverse sectional elevation of a chambered filtering-block, showing an integral brace for strengthening the sides to prevent collapse. Fig. 11 is an elevation of a slatted keeper for holding the blocks in position. Fig. 12 is a sectional elevation of a filter embracing the present invention and having means for cooling the water. Fig. 13 is a sectional elevation on lines *x x*, Fig. 12, showing the valleys for receiving the drip of cold water from the cooling-chamber. Fig. 14 is a plan view of the slatted keeper, showing recesses to allow the same to pass the locking-arms and the pivoted plates for covering the recesses. Fig. 15 is a plan view of the supplemental bottom employed in the cooling-filter.

In constructing a filter in accordance with my invention the great object to be attained is a filtering area of sufficient size to allow a supply of filtered water equal to the demand without the necessity of increasing the size of the filter proper to an extent greater than that in ordinary use. To this end there is employed a plurality of interiorly-chambered rectangular blocks placed in parallel relation to allow the unfiltered water to surround all but one edge of the same, thereby causing an inflow to the central chamber of the block of filtered water from all directions save one edge.

1 designates the casing of the filter, preferably formed of cast metal to insure rigidity. The casing is formed with the chamber 2 for unfiltered water and a chamber 3 for the filtered water, from which the filtered water is drawn either from a cock 4 or the pump 5. (Shown in Fig. 7.) Within each chamber 2 is arranged a plurality of interiorly-chambered rectangular filtering-blocks 6, each formed of a plastic porous material, rectangular in shape, and having an interior chamber 7 of rectangular contour, whereby the inclosing sides are of uniform thickness. Upon one edge of the block is an opening 8, through which the filtered water passes from chamber 7 into chamber 3, and to properly seal the opening from ingress of unfiltered water or egress of filtered water between the blocks there is formed a depression 9 around the opening 8 to receive a compressible seal 10 upon a compressible cushion 11.

The filtering-blocks are secured within chamber 2, after being placed side by side in

parallel order, by means of slatted keepers 12, the slats 13 of which are of an equal width to that of the edge of the filtering-blocks, and placed to coincide therewith when the blocks are in position, and bear upon the compressible cushions 11, with the effect, when tightly forced against the cushions, of sealing the blocks from the passage of water to or from the same, except as it finds egress through openings 8, the cushions also conforming to the unevenness of the surface of the pottery filtering-block, and allowing of great pressure against the blocks to hold them in place, and also to compress the seal tightly around opening 8.

The keepers are held closely against the cushions by means of locking-arms 12′, pivotally secured to the casing to be turned upon their pivots in the arc of a circle whose radius is bisected by the plane of movement of the keeper, so that the arms increase in pressure upon the keeper as they are moved upon their pivots. For guiding the arms the keeper is provided with a channeled bar 14′, into which the outer ends of the arms move, and for greater rigidity of the slats 13 of the keeper they are made angular.

In the style of filter shown in Fig. 1 there is an angled plate 14, the vertical side of which has elongated openings 15, through which bolts 16 pass, and the horizontal side 17 bears upon the upper ends of the filtering-blocks to hold them from vertical displacement, while spring-hooks 17′ engage the edge of the keeper to hold the same vertically.

In the style shown in Figs. 12 and 13, the supplemental bottom 18 is placed in chamber 2, and comprises a plurality of flat elevated portions 18′, having openings to coincide with openings 8 in the blocks, (which are upon the flat portions 18,) and between the portions 18′ are formed valleys 19, substantially semicircular in cross-section, whereby when the ice is placed in chamber 2 the dripping and cooled water in said chamber will cool the metal of the valleys, and thereby cool not only the water before entering the filtering-blocks, but also the filtered water in the chamber 3, the water from the valleys being drawn off through a drain 20, with which the valleys communicate. In this construction the keeper is cut out upon the opposite sides to allow of passing the arms, and the bar 14′ is pivoted to swing from over the cut-away portions until the keeper is placed upon the blocks and then over the same to receive the ends of the arms. In order to further cushion the blocks, in addition to cushions 11 there may be cushions 11′ upon the side opposite to the one having the springs 8, whereby the blocks are cushioned at each point of pressure.

In order to remove the deposit upon the sides of the filtering-blocks and to fully clean the chamber 2, there is a cleaner 21 employed, comprising a handle-rod 22, a head 23, and spring-arms 24, upon which is secured brushes 25, preferably of aluminium wire, which, when the brushes are reciprocated, remove the sedimentary deposit, which is then drawn off through cocks communicating with chamber 2, the spring-arms automatically adjusting to the wear of the brushes.

In the cistern-filter, Fig. 7, and also the cooling-filter, there are air-pipes 26 to prevent a vacuum in drawing the water from chamber 3. In Fig. 10 the filtering-block is shown as constructed with a brace 27, extending transversely across the interior chamber to prevent collapse under great pressure.

It will be seen that I have prepared for adaptability to all the styles of filters demanded by the trade, and that the parts are easily assembled with provision for a maximum filtering area to a minimum area of filtering-chamber.

What I claim is—

1. In a filter, a casing, a dividing-wall therein forming a chamber for unfiltered water and a chamber for filtered water, a series of rectangular filtering-blocks in the chamber for unfiltered water, said blocks resting against the bottom of the casing and against the wall respectively, a slotted keeper bearing against the blocks, an angled plate secured to the wall having spring-arms to engage the upper edge of the keeper, the lower edge of the keeper having transverse grooves and arms pivoted to the bottom of the casing at one end, the opposite end engaging in the grooves, and a rod to force the arms together and the keeper forward against the filtering-blocks.

2. In a filter, a casing, a chamber for filtered and a chamber for unfiltered water therein, a series of filtering-blocks in the unfiltered water-chamber, a cleaner for the blocks comprising a cross-piece, arms depending therefrom between each set of filtering-blocks, a U-shaped spring-holder of the length of the filtering-blocks secured upon the lower ends of the rods and brushes secured in each side of the holder normally bearing against the filtering-blocks.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

JOHN F. ZIEGLER.

Witnesses:

WILLIAM WEBSTER,

CARROLL J. WEBSTER.