

No. 632,461.

Patented Sept. 5, 1899.

O. HOFFMANN.

MEANS FOR AUTOMATICALLY CLEANING FILTERS

(Application filed June 16, 1899.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 1.

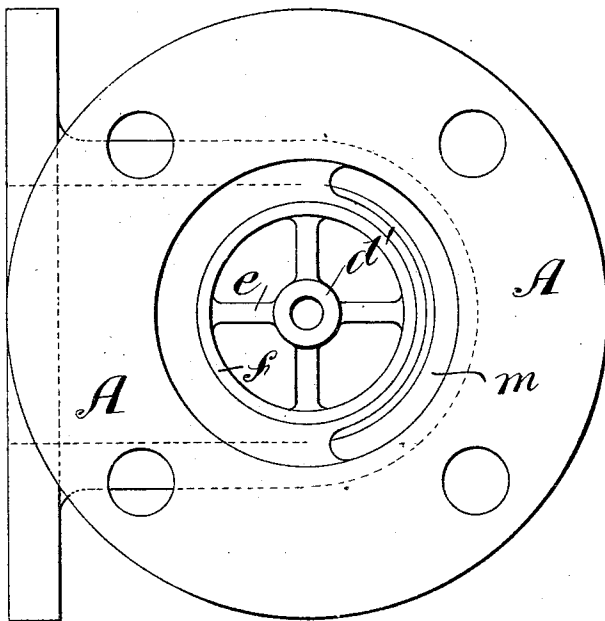
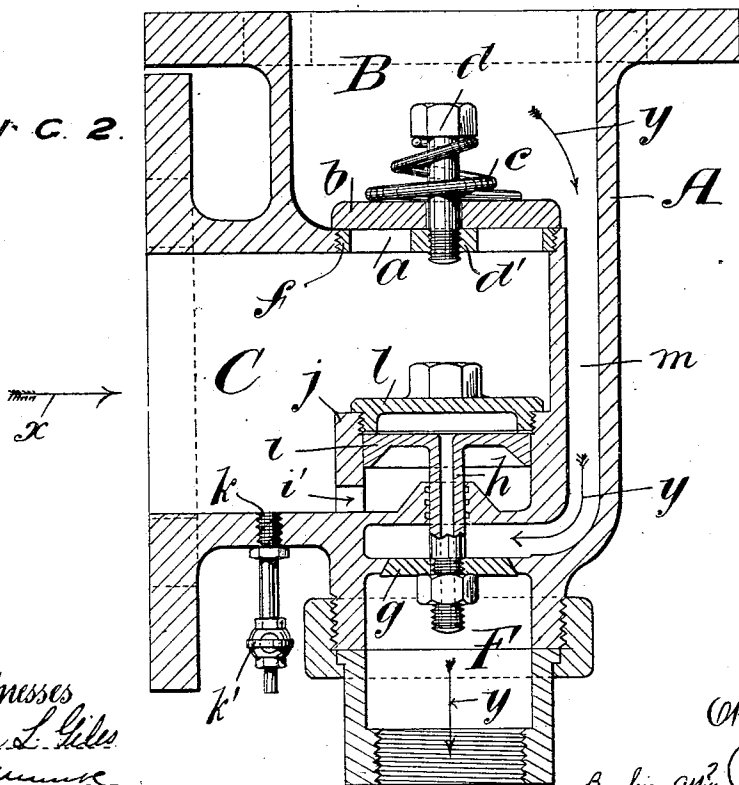


FIG. 2.



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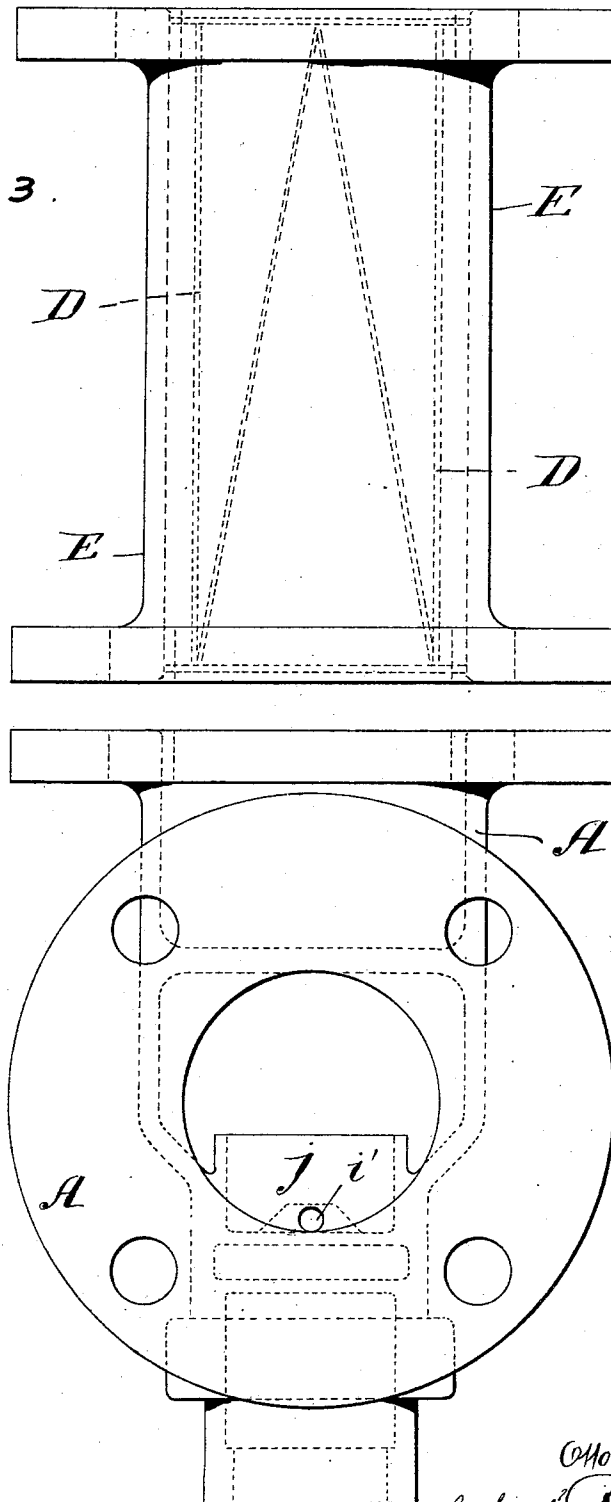
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2 Sheets—Sheet 2.

FIG. 3.



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UNITED STATES PATENT OFFICE.

OTTO HOFFMANN, OF WITHINGTON, ENGLAND.

MEANS FOR AUTOMATICALLY CLEANING FILTERS.

SPECIFICATION forming part of Letters Patent No. 632,461, dated September 5, 1899.

Application filed June 16, 1899. Serial No. 720,824. (No model.)

To all whom it may concern:

Be it known that I, OTTO HOFFMAN, engineer, a subject of the Emperor of Germany, residing at West View, 18 Wellington road, Withington, near Manchester, in the county of Lancaster, England, have invented a certain new and useful Improvement in Means for Automatically Cleansing the Filters Used in the Filtration of Liquids Delivered Under Pressure, also applicable for the purpose of emptying the service-pipes of their contents on the supply being cut off, (for which I have made application for a patent in Great Britain, No. 2,135, dated January 31, 1899,) of which the following is a specification.

My said invention relates to means for automatically cleansing the filters used to filter liquids delivered under pressure for various purposes, such as for humidifying apparatus used for moistening the air in factories and in other situations.

Further, my invention is equally applicable for use in automatically emptying the service-pipes used for the indicated purposes of their contents when the pressure is cut off, so as to prevent the water in the pipes becoming frozen or for any other reason.

The accompanying two sheets of drawings clearly illustrate my invention.

Figure 1 is a plan view of my improved valve, showing the valve-seating with the valve removed. Fig. 2 is a sectional elevation with the valve in place. Fig. 3 is an outside view of the valve at right angles to Fig. 2 and showing the same in conjunction with a filter.

In carrying my invention into effect I provide a suitable casing or receptacle A, preferably disposed near to the force-pump employed or the main service-pipe, as the case may be. The casing A is divided into two chambers B C. The chamber C is in connection with the water-supply, and the chamber B is in communication with a suitable filter D, carried within a casing E, secured to the valve-casing A, as shown in Fig. 3.

The filter D may be of any suitable description and is shown in the drawings as being composed of an outer cylindrical body of fine metallic gauze containing within a conical body of gauze, thus forming two walls, afford-

ing a large filtering-surface within a comparatively small area.

Access to the chamber containing the filter D is provided for by an opening *a*, governed by a valve *b*, opened against the action of a spring *c*. The valve *b* slides upon a spindle *d*, screwed to a boss *d'*, carried by radial arms *e* of a screwed ring *f*, as shown more clearly in Fig. 1.

A waste-water outlet F is provided to the casing A from the chamber B, leading to the filter D, which outlet is closed by means of a valve *g*, carried on the end of a hollow spindle or rod *h*, which projects within the chamber C in connection with the water-supply. This spindle *h* is provided with a piston *i*, working within a short cylinder *j*, formed in the chamber C. The area of this piston *i* is greater than the area of the valve *g* on the end of the hollow rod. In addition, the chamber C in connection with the supply is provided with a relief-aperture *k*, which is governed by a suitable valve *k'*.

The action of the apparatus is as follows: Water is forced by the pump or other means into the apparatus, as shown by the arrow *x*, the pressure entering below the piston *i*, through the passage *i'*, and raising the piston *i* within the cylinder *j*. Any air or water contained within the cylinder *j* is ejected through the hollow piston-rod into the waste-water pipe F. The head of the piston is thrust fluid-tight against a suitable lid or cover *l*, screwed upon the short cylinder, and the valve *g* on the end of the rod *h* in this position is brought against its seating, closing the waste-water pipe F. The pressure of water increasing, the valve *b* to the chamber B is thrust off its seat against the action of the spring *c*, and the water is forced through the filter D to the service-pipes, which are suitably connected to the filter-casing E, and from thence to the point of delivery.

When it is desired to cleanse the filter D, the water-feed is stopped. The pressure being thus removed the water contained in the chamber C is drained away by the relief-aperture *k*, and the valve *b*, governing the entrance to the chamber B, is closed by the spring and water pressure above the valve *b*. The water in the service-pipes, which pipes are

at a higher level than the apparatus containing the filter, escapes by way of a semicircular passage *m*, as shown by the arrows *y*, through the waste-water outlet *F*, the pressure forcing the valve *g* off its seat, the piston on the valve-rod being no longer raised by the water-pressure. A reverse current of water thus passes through the filter *D*, carrying with it the impurities deposited thereon, to the waste-water pipe. The service-pipes are also emptied of their contents, so that, if desired, the apparatus may be employed without a filter for the purpose of automatically emptying the service-pipes on the water-supply to the pipes being shut off. The relief-aperture *k* provided may be so governed by the valve *k'* that the closing of the delivery-valve *b* to the filter *D* and the opening of the valve *g* to the waste-water pipe *F* on the cutting off of the supply may be accelerated or retarded at will. As the relief-aperture is only used to accelerate the action of the valve, it may, if desired, be dispensed with.

I declare that what I claim is—

1. In a filtering system, a casing *A* having an inlet-chamber *C* and outlet-chamber *B*, a check-valve closing the port connecting said

chambers, an outlet from said chamber *C* with means for controlling the flow of water through the same, a waste-water outlet from the chamber *B*, a normally-closed valve closing said outlet, and means whereby said valve is opened on the removal of water-pressure in chamber *C*, substantially as described.

2. In a filter system, a casing *A* having a chamber *C* connected with the water-supply, a chamber *B* connected with the filter, a check-valve closing the passage between said chambers, means for emptying the chamber *C* on the cutting off of the water-supply, a waste-water outlet from the chamber *B*, a piston-chamber having a piston therein, a valve operated by the movement of said piston against the pressure of water in said waste-outlet, and a passage leading from said chamber *C* to said piston-chamber beneath the piston, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

OTTO HOFFMANN.

Witnesses:

J. ENTWISLE,
ALFRED YATES.