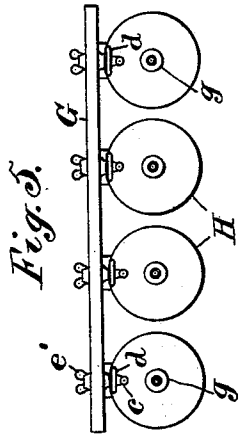
No. 623,894. Patented Apr. 25, 1899.

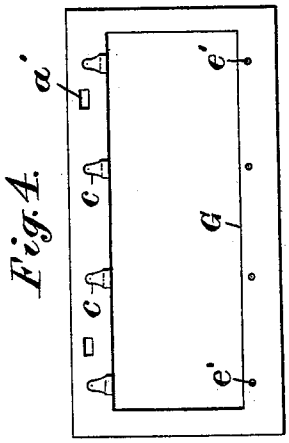
W. A. FREISE.

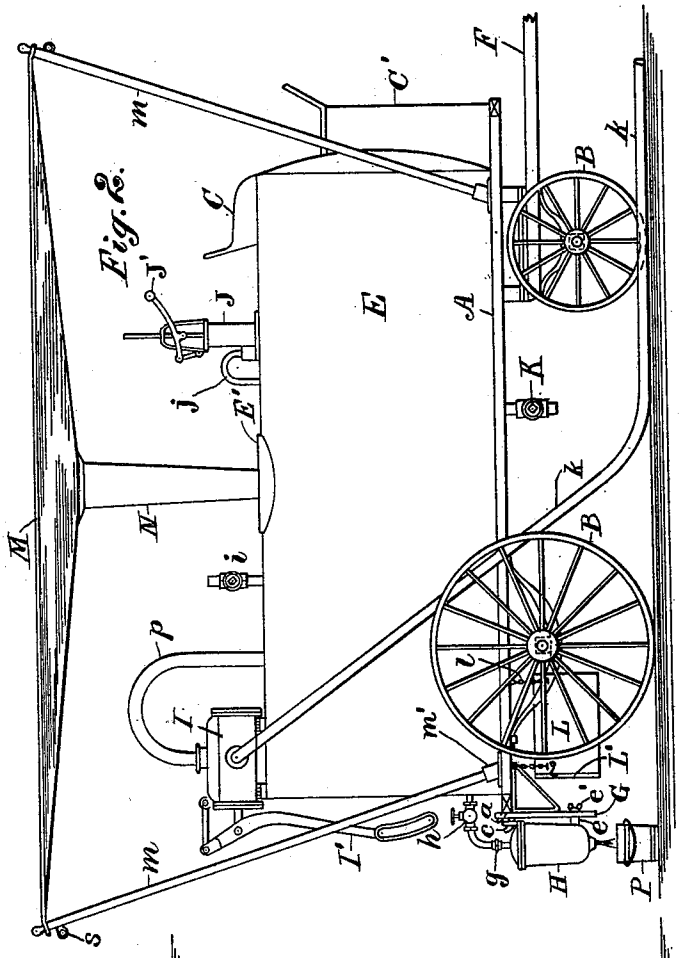
AMBULANT FILTER.

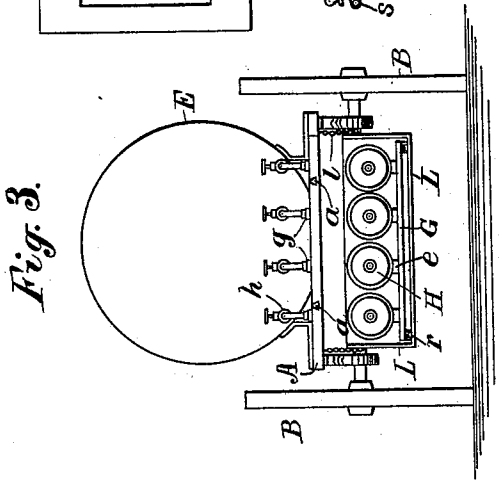
(Application filed May 16, 1898.)

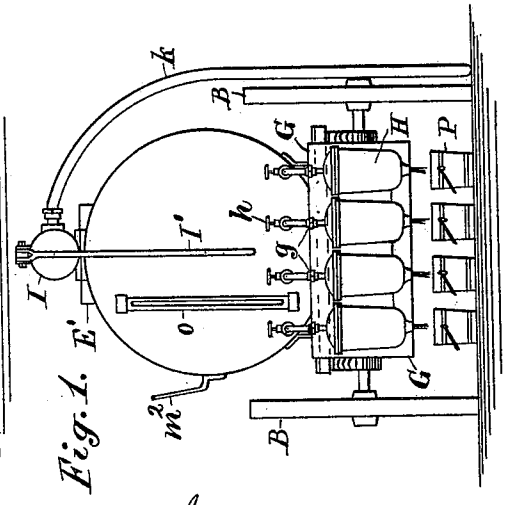
(No Model.) 2 Sheets—Sheet 1.











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No. 623,894. Patented Apr. 25, 1899.

W. A. FREISE.

AMBULANT FILTER.

(Application filed May 16, 1898.)

(No Model.) 2 Sheets—Sheet 2.

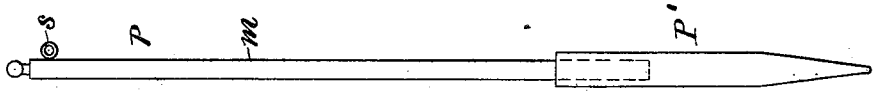


Fig. 8.

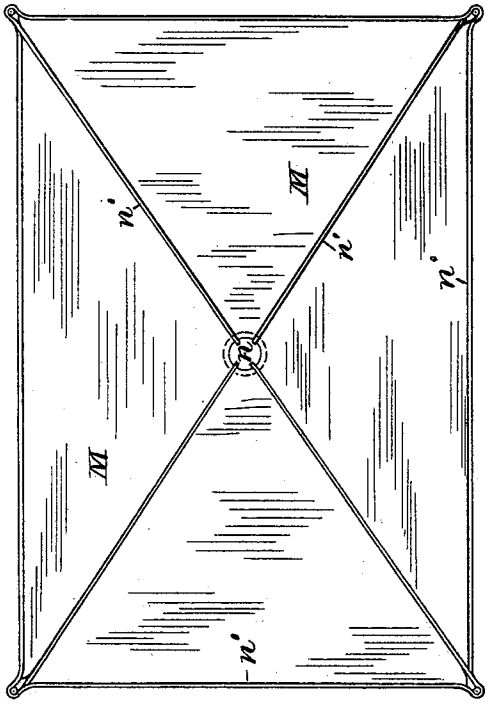


Fig. 7.

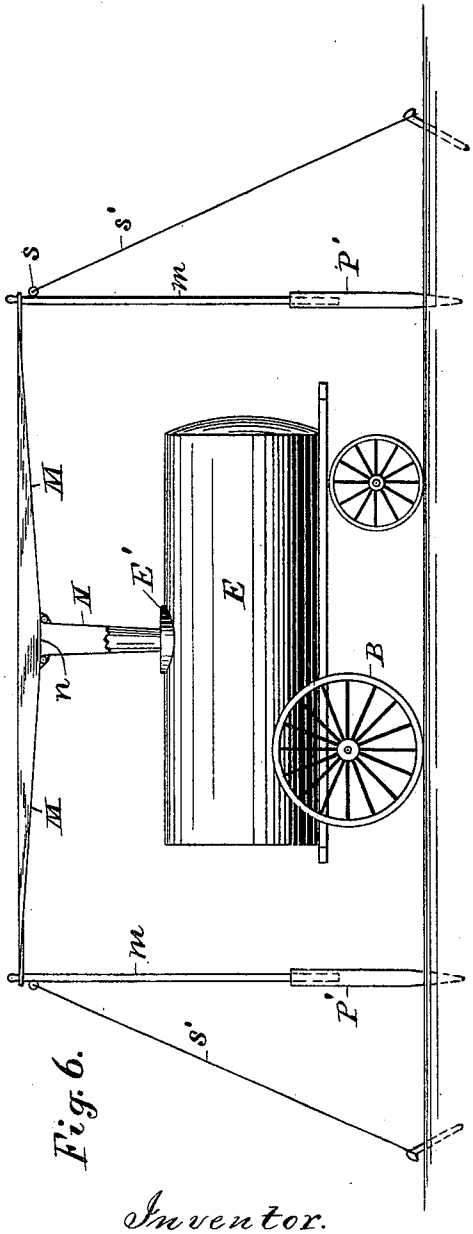


Fig. 6.

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UNITED STATES PATENT OFFICE.

WILLIAM A. FREISE, OF NEWARK, NEW JERSEY.

AMBULANT FILTER.

SPECIFICATION forming part of Letters Patent No. 623,894, dated April 25, 1899.

Application filed May 16, 1898. Serial No. 680,788. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. FREISE, a citizen of the United States, residing in the city of Newark, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Ambulant Filters, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The present invention is intended, primarily, to furnish a means of securing potable water for army troops in the field; and to effect this object I have combined with a carriage supporting a water-tank a series of filters attached removably to the tank (so that they may be detached for cleaning and safe transportation) and a pump discharging into the tank and provided with a suction-hose to draw the water from any accessible pond, stream, or other water-supply.

The filters are preferably secured together upon a frame which may be hung upon the carriage below the outlet-cocks of the tank, to which the filters are detachably coupled, and a box is swung by chains beneath the tank to contain such frame and filters when in transportation.

The filters shown in the drawings are of the style claimed in my Patent No. 528,630, dated November 6, 1894, which is of such materials that it may be perfectly cleansed by taking it apart, and in practice I employ a series of the filters in connection with the tank to filter a large volume of water by gravity in a short space of time. Each filter may have a capacity of two or more gallons per minute, and the apparatus is shown in the drawings provided with four such filters having each a pail set beneath the same, into which the water would be delivered with as great rapidity as they could be conveniently handled. Where the water contains a great deal of sediment, so as to rapidly foul the filters, the flow of the water would be diminished except its pressure be increased, and to provide for such contingencies the suction-pipe of the pump may be adapted to supply the pump with air or water, so that water may be supplied to the tank by the pump when required, and air may then be supplied to the pump by merely removing the end of the suction-pipe from the source of water-supply and permitting the air to enter. The air pumped into the tank then operates to produce the desired pressure upon the current flowing through the filters. In practice I prefer to use a separate pump to force the air in.

To secure a supply of drinkable water in any district where there is considerable rainfall, I provide a pan-shaped awning and means of support to hold it above the tank, with a leader extending from the center of the awning into the tank to deliver directly therein the water which falls upon the awning. The awning is sustained by poles at the corners, and it naturally sags at the middle, where the leader is attached, and the poles may be projected rigidly from the body of the filter-wagon or may be supported upon the ground at the sides of the wagon, being braced in either case by suitable guy-ropes while in use.

The invention will be understood by reference to the annexed drawings, in which—

Figure 1 is a rear elevation, and Fig. 2 a side elevation, of the entire apparatus. Fig. 3 is a rear elevation of the apparatus with the filters stored in the swinging box. Fig. 4 is a rear view, upon a larger scale, of the supporting-frame of the filters; and Fig. 5 is a plan of the frame and filters secured thereon. Fig. 6 is a sectional elevation of the awning with the poles supported upon the ground and the filter-wagon represented merely by the tank and wagon-wheels. Fig. 7 is a plan of the awning, and Fig. 8 is an enlarged view of one of the awning-poles.

A designates the frame or body of the filter-wagon, provided with suitable running-gear B and sustaining the tank E. A seat C for the driver is mounted upon the front end of the tank E. Part of a wagon-pole F is shown projected from the running-gear at the end of the wagon where the seat is arranged, the drawing not affording space enough for the entire pole. A brake would be supplied to the wagon in practice.

The rear end of the wagon-body A is provided with hooks *a*, upon which a rectangular frame G may be suspended to support the series of filters H below the rear end of the tank. The frame G is provided along its upper edge with a series of hooks *c*, and each filter is provided with a loop *d* to suspend it upon one of the hooks, the lower end of the

filter having a lug *e*, which is secured to the lower part of the frame by a suitable thumb-screw *e'*. The hook *c* supports the weight of the filter, while the screw secures it detachably to the frame, so that it may be readily removed and replaced when necessary.

Brackets are attached to the wagon-body A, below the rear beam of the body, to hold the frame G vertical when supported upon the hooks *a*, so as to hold the filters upright when in use. The rear end of the tank above each filter is provided with a pipe having cock *h*, which may be connected to the top of the filter by a flexible pipe and coupling *g* when the frame G, with the filters, is set in place.

A water-gage *o* is shown upon the tank to indicate when it requires refilling. The pump I is shown mounted upon the tank and provided with a hand-lever I' to actuate it. Its outlet is connected with the top of the tank by pipe *p* and its inlet with a hose *k* to draw water from any suitable source. The pump may be set upon the wagon-body A, which in the illustration is merely a rectangular frame to support a cylindrical wrought-iron tank upon the running-gear.

An air-pump J, having handle J' and having its outlet connected with the tank by pipe *j*, is provided to produce pneumatic pressure within the tank when desired.

A vent-cock *i* is shown upon the tank to discharge air when water is pumped into the tank, but would be closed when it is desired to produce pneumatic pressure therein. Such necessity would not exist when the filter was clean; but when the current flows slowly through the filters the manhole E' is closed with a tight cover and the air pumped in to force the water through the filters.

A mud-cock K is provided to drain out the bottom of the tank.

When moving the apparatus from one source of water-supply to another, the hose would be wound about the tank and the filters would be detached from their several cocks by unscrewing the couplings *g*. The frame G may then be lifted from the hooks *a* and stored, with the filters, in the box L, which is shown suspended beneath the rear of the wagon-body. The frame G or the box is provided with rolls *r* to diminish the friction when sliding it into and out of the box, and a door L' at the rear of the box is provided to retain the filters therein when in transportation. The box is suspended by chains *l*, which permit it to swing beneath the body, and the jolting of the wagon is thus prevented in great part from jarring the filters.

By releasing the thumb-screw *e'* the filter may be removed from the frame to detach the cover for cleaning in the manner set forth in my above-mentioned patent, No. 528,630, issued November 6, 1894.

Any suitable make of filter may be used, and such detachability adapts the filter to be cleansed in a manner appropriate to its construction, and thus avoids any complication of pipe connections for reversing the current through the filter to cleanse it.

In Fig. 2 poles *m* are shown inclined outwardly from the corners of the body A, being supported in sockets *m'* upon the body, and sustain an awning M, having a central opening *n*, with a canvas leader N, extended down therefrom into the manhole E' upon the top of the tank.

In Fig. 6 the awning is shown in vertical section through the leader, (excepting the lower end of the same,) exhibiting a ring of wood or rope around the opening *n*, with the canvas leader secured to such ring.

In Fig. 7 ropes *n'* are also shown around the margin of the awning and extending from the corners toward the opening *n*.

Fig. 6 shows the poles supported upon the ground adjacent to the wagon, and as longer poles are required in such case than when they are fitted in the sockets *m'* upon the wagon-body I provide extension-pieces P', having holes into which the feet of the poles are fitted. Eyes *s* are shown attached to the upper parts of the poles, and in Fig. 6 guy-ropes *s'* are shown extended from such eyes to stakes *q* in the ground and may be used when possible whether the poles be supported upon the wagon-body or the ground. The awning and its leader N are entirely flexible and may thus be rolled up for transportation and packed within a box C' beneath the footboard of the driver's seat C, and the poles may be carried upon brackets m^2 upon the tank or wagon-body, as shown at the left side of Fig. 1.

The combination of the awning with the tank furnishes a means of securing an exceptionally clean and wholesome water-supply, as it catches the water before it has fallen upon the earth and mingled with any organic matter. Water thus collected would clog the filters very little, and thus permit their use for a much longer time without cleansing.

The awning is preferably supported upon the earth, as the poles may thus be set farther apart, and an area of twenty feet by thirty feet may readily be covered to collect a large amount of the rainfall. The support of the awning upon the wagon-body permits the collection of water during rain-storms while the apparatus is in transit from one place to another, and thus avoids the delay of securing water at the end of the journey. In most cases a plain suction-pump may be used and would be made of large capacity, as the apparatus may generally be set close to a brook or pond and the water elevated but a short distance.

A pail P is shown upon the ground beneath each filter, and the apparatus is obviously adapted for use with a single filter, although the battery of filters shown in the drawings provides a means of filtering a large water-supply with great rapidity.

I have made a broad claim to the rain-

catching awning in a separate application and have therefore in the present application only claimed the same in combination with an ambulant filter.

Having thus set forth the nature of my invention, what I claim herein is—

1. An ambulant filter comprising the wagon-body and running-gear, the tank E having the delivery-cock *h* with a filter coupled detachably thereto, as by the coupling *g*, and means for supporting the filter detachably upon the wagon-body.

2. An ambulant filter comprising the wagon-body and running-gear, the tank E having a series of delivery-cocks *h*, a series of filters mounted detachably upon the wagon-body, and a detachable connection for each filter to one of the cocks, substantially as herein set forth.

3. An ambulant filter comprising the wagon-body and running-gear, the tank E having a series of delivery-cocks *h*, a frame having a series of filters secured thereon, means for supporting the frame detachably upon the wagon-body, a detachable connection from each of the filters to one of the cocks, and a box suspended by chains upon the wagon-body to contain such frame and filters when the latter are not in use, substantially as herein set forth.

4. An ambulant filter comprising the wagon-body and running-gear, a tank having one or more filters connected detachably thereto, a suction-pump with hose for drawing water from any convenient source, and having a connection to deliver the water into the tank, the whole adapted for transportation together, substantially as herein set forth.

5. An ambulant filter comprising a filter and supply-tank comprising the wagon-body and running-gear, a tank having one or more filters connected detachably thereto, and a pump having its suction-pipe adapted for connection with the water-supply and with the atmosphere, to pump water or air at pleasure into the tank, as and for the purpose set forth.

6. The combination, with an ambulant filter comprising a filter and supply-tank, of a pan-shaped awning having an opening with leader to conduct the water into the tank, and means for supporting it above the tank, substantially as herein set forth.

7. The combination, with an ambulant filter, of a pan-shaped awning having an opening with canvas leader to conduct the water into the tank, poles adapted to support the awning upon the wagon-body, and extension-pieces for such poles to support the same upon the earth when desired, substantially as herein set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM A. FREISE.

Witnesses:
THOMAS S. CRANE,
L. LEE.