(No Model.)

J. M. WELLS.

FILTER.

No. 458,204 Patented Aug. 25, 1891.

Fig. 1

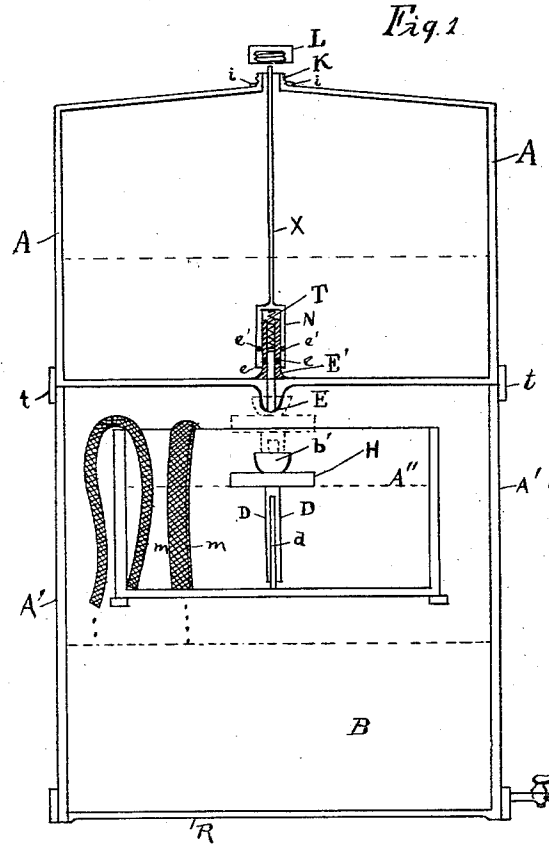


Fig. 2.

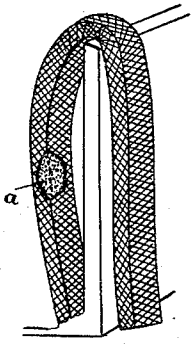


Fig. 3.

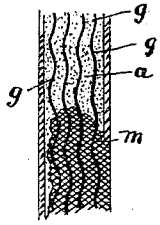
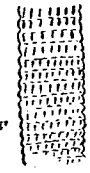


Fig. 4.



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UNITED STATES PATENT OFFICE.

JAMES M. WELLS, OF PEORIA, ILLINOIS.

FILTER.

SPECIFICATION forming part of Letters Patent No. 458,204, dated August 25, 1891.

Application filed March 2, 1891. Serial No. 383,519. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. WELLS, a citizen of the United States, residing at the city of Peoria, in the county of Peoria and State of Illinois, have invented certain new and useful Improvements in Automatic 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.

My invention relates to certain new and useful improvements in filters by means of which a filter is provided being simple in construction, durable, and cheap in first cost.

More particularly my invention relates to a filter which performs its office through the action of capillary attraction through an absorbent packed loosely within a woven-wire case, with the particles of absorbent merely packed together and not woven or braided, and to the general construction of the framework, consisting of three compartments, from which the oil is conducted from the top to the middle and from thence to the lower compartment by means hereinafter more particularly described, making as a whole a complete, self-regulating, and, in a sense, an automatic filter.

That my invention may be more fully understood reference is had to the accompanying drawings, in which—

Figure 1 is a cut sectional view showing the adjustment of the several compartments and the relation they sustain one to another. Fig. 2 is a detailed view showing a woven-wire casing containing an absorbent carried over the edge of a vat and dependent therefrom. Fig. 3 is a cut sectional view through a woven-wire case containing an absorbent material and separated into layers by means of corrugated strips. Fig. 4 is a section of a conductor, consisting of an absorbent material interwoven with lineal and cross-wires.

In Fig. 1, A represents the upper compartment, the same being provided with the opening K, which is closed by means of the cap L, there being provided the gasket *i* to provide a perfectly-fitting joint to prevent the entrance of air into the compartment A. The bottom of the compartment A is closed, with the exception that there are provided the upwardly-tending spout E′ and the depending spout or drip-pipe E, there being a corresponding opening in the bottom of the compartment A, and immediately at its center, connecting the two spouts, the spout E being provided with the openings *e e* in its sides.

N is a sleeve designed to fit over the spout E′, the same being provided with the openings *e′ e′*, to which sleeve is connected the rod X, which bears upward through the opening in the top of the compartment, and is held in position by fitting closely upon the spout E′.

T is a spring, carried within the spout E, and connected therewith at one of its respective ends and to the upper part of the sleeve N at its other end, and is designed to bear the sleeve upward.

A′ is a compartment upon which the compartment A is carried and within which is suspended the vat A″, which said vat is designed to be rectangular in form and carried at its corners upon suitable shoulders within the compartment A′, which said vat is designed to be filled with oil from the compartment above, the same running through the spouts E E′, the spout or drip-pipe E, depending from the bottom of the compartment A to a point a little below the compartment A, and to the bottom of the said vat is fixed the upwardly-extending rod *d*, over which is carried loosely the sleeve D, upon the upper end of which is carried the float H, the same being provided with the cup *b′*, which is designed to close over the opening in the spout E when the vat becomes sufficiently full, and the cup is buoyed upward into the said position by means of the float H.

Within the vat A″ are placed a series of woven-wire cases, containing absorbent material, the same depending within the vat to its bottom, and bearing over the edge of the vat depends from without to a point below the bottom of the said vat, as best shown in detail in Fig. 2, and through which the oil in the vat is designed to be filtered by capillary attraction through the absorbents carried in the woven-wire cases and to drip into the compartment below, from which it may be drawn through the faucet F.

In operation as a filtering device the compartment A is first filled with the oil which is desired to be filtered, and when the compartment A is so filled the cap L is screwed down and the oil will flow from the compartment A through the spouts E' E into the vat A''. The oil flowing into the vat A'' fills the same to the desired point, and is prevented from being filled to overflowing by means of the spout E, depending from the bottom of the compartment above, so that when the oil in the vat rises to a certain point the buoy H, bearing upward with the oil, carries with it the cup *b'*, which said cup is constantly filled with oil from the pipe E. The said cup closing over the pipe E submerges the lower edge of the same, which at once stops the flow of oil from the upper compartment by the mere submerging of the lower edge when the upper compartment is substantially air tight and would effectually close it by contact and upper pressure even though the upper compartment were open at its top. The oil in the vat A'' is conducted therefrom and thoroughly filtered through the absorbents, consisting of small particles loosely packed in the woven-wire casings *m m*, the said casings being rigid in form, so that bearing over the edge of the vat the absorbent is not in the least compressed but remains loose and allows as free a passage for the liquid at this point as at any other, as the absorbent material is packed in the casing with the small particles thereof sustaining no relation to each other aside from contact, so that the absorbent material in the depending portions of the casings will not tend to draw downward the absorbent material at the point where it curves over the edge of the vat, as would be the case with a wick, the particles of which being interwoven are merely thrown over the edge of the vat; and by the use of the woven-wire casing substantially the entire surface of the absorbent in that part of the casing immersed in the oil is brought in contact with the liquid, rendering it very efficient as a conductor through the action of capillary attraction, every portion of the absorbent being able to work, thus rendering it a perfect unobstructed conductor. The casing may be divided by means of corrugated partitions with the intervals filled with absorbent material, as shown in detail in Fig. 3. The oil, dripping from the absorbent carried in the casing without the vat, fills the compartment below, and the said compartment never becomes too full or so full as to overflow the vat A'', as it is impossible for the oil to rise higher in the lower compartment than the level of the oil in the vat A'', which said level is always at a point below its upper edge, thus completing a self-regulating and substantially automatic filtering device.

When it is desired to remove the compartment A from its bearings on the compartment A', the cap L is removed, as the tendency would be, through the pressure of the atmosphere admitted, for the oil to flow freely through the spouts E' E. To prevent this there is provided the sleeve N, carried loosely over the spout E', and to which is attached, as before described, the upwardly-extending rod X, which it will be seen from the drawings, is carried through the opening in the top of the compartment A and to a point slightly above the same, in which position it will be seen that the openings *e' e'* in the sleeve are carried to a point above the openings *e e* in the spout, the sleeve being held upward by means of the spring T, thus rendering it impossible for oil to escape. The compartment A being again adjusted in position, the cap L is screwed down over the opening K, with its lower edge bearing upon the gasket *i*, thus rendering it impermeable to the atmosphere, and as the said cap is screwed down the same contacting with the rod X, depresses the same and with it the sleeve N and the spring T, so that the openings *e' e'* align with the openings *e e* in the spout E', when the oil is permitted to flow from the compartment A into the vat below.

In Fig. 4 is shown in detail a modified form of conducting medium from that hereinbefore described, and consists, essentially, of a series of lineal and cross wires interwoven with an absorbent material, which said wires are designed to sustain the weight of the absorbent material to prevent its being compressed at any point by contact with anything over which it may depend.

The various parts of the device may be made of any suitable material, and instead of the woven-wire casing within which the absorbent material is carried any perforated substance may be used.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a filter, the casing *m*, with rectangular sides and arched at its upper portion and filled with absorbent material, in combination with the vat A'', over the edge of which it is carried, and depending within and without and designed to filter oil contained within the vat by capillary attraction, all substantially as described and set forth.

2. As a filtering means, the woven-wire casing *m*, provided with the intermediate corrugated woven-wire strips *g g g*, with the intervals filled with small particles of absorbent material, all substantially as described and set forth.

3. The combination, in a filter, of the compartments A A', carried one upon the other, and with the upper compartment A provided with the opening K, and the cap L, with the depending spout E and the upwardly-tending spout E', having the openings *e e*, the sleeve N, having the openings *e' e'*, with the upwardly-tending rod X connected therewith, the spring T, the vat A'' within the compart-

ment A′, carried upon suitable lugs and having the rod *d* fixed upon the bottom, the sleeve D, bearing float H, the float H, having cup-shaped depressions *b′*, and the woven-wire cases *m m*, filled with absorbent material and hung over the edges of the vat and depending one end within to its bottom and the other end from without to a point below the bottom of the vat, with the compartment A′, provided with the faucet F, all substantially as described and set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JAS. M. WELLS.

Witnesses:
R. N. McCORMICK,
JOSIE TEFFT.