(No Model.)

A. C. NEWCOMB.

APPARATUS FOR FILTERING AND CLARIFYING LIQUIDS.

No. 571,312. Patented Nov. 10, 1896.

Fig 2

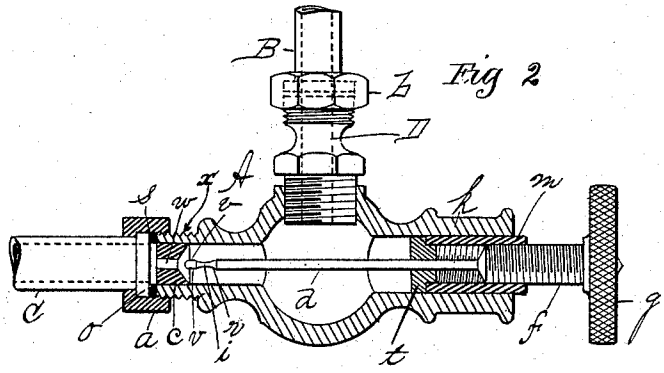

Fig 1

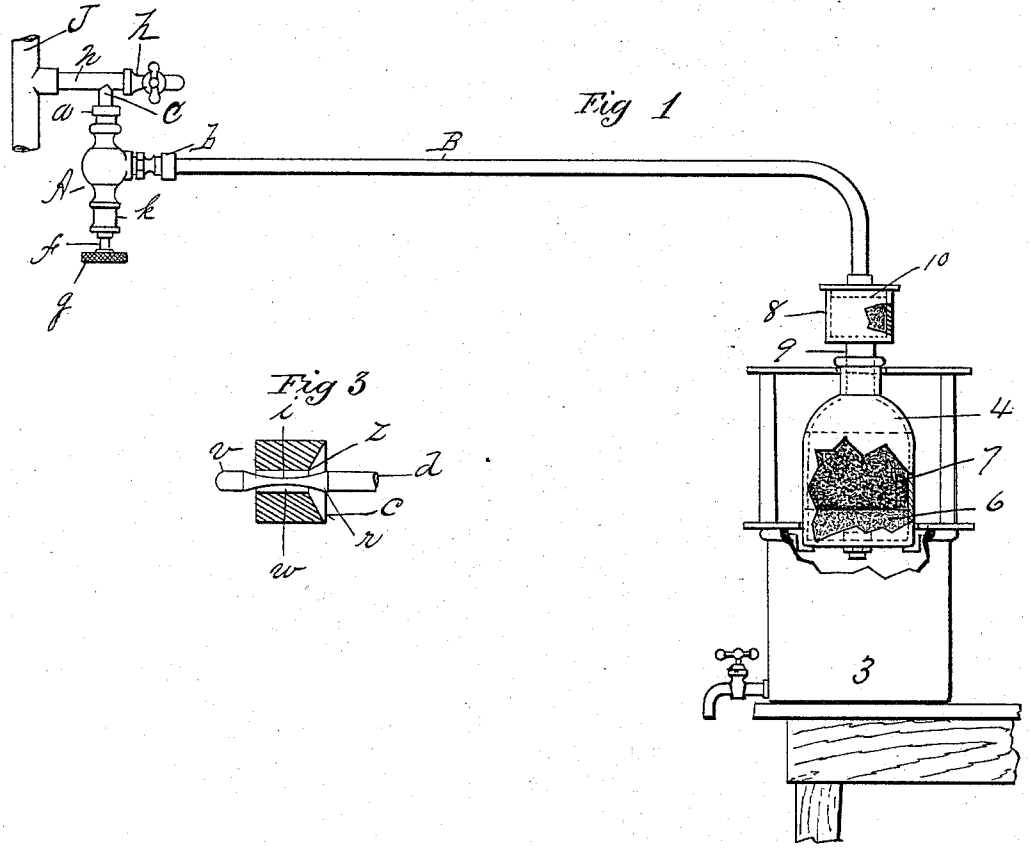

Fig 3

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APPARATUS FOR FILTERING AND CLARIFYING LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 571,312, dated November 10, 1896.

Application filed March 25, 1896. Serial No. 584,747. (No model.)

To all whom it may concern:

Be it known that I, ALBERT C. NEWCOMB, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Apparatus for Filtering and Clarifying Water, of which the following is a specification.

This invention relates to apparatus for filtering and clarifying water, the object being to provide, in connection with means for separating deleterious substances therefrom, improved devices for governing the flow of the water to and through said apparatus; and the invention consists in the peculiar construction and arrangement of various parts of said apparatus, all as hereinafter fully described, and more particularly pointed out in the claims.

In the drawings forming part of this specification, Figure 1 is a side elevation of water-filtering and water-flowing governing devices constructed according to my invention, a part of this figure being shown broken away to better illustrate the construction shown. Fig. 2 is a longitudinal sectional view of valve devices hereinafter described. Fig. 3 is an enlarged sectional longitudinal part of said valve devices hereinafter referred to.

In the drawings, J indicates a water-service pipe of the ordinary description employed to conduct water into a building, and *n* represents the shank, and *h* the body, of a faucet connected in the usual manner to said pipe J. A short branch pipe C is secured on said shank *n* of said faucet and extends laterally therefrom, as in Fig. 1, and serves as a conducting-pipe through which may flow water from said faucet-shank. The said pipe C has an annular collar *o* (see Fig. 2) and a union-nut *a* on said pipe C, engaging with said collar *o*.

A indicates a valve having a body, as illustrated in Fig. 2, on one end of which is an extended neck *x*, which is screw-threaded, and to the extremity of said neck the said pipe C is connected by screwing said union-nut thereonto, as shown. Between the end of said pipe C and the adjoining extremity of said neck *x*, on which said union-nut *a* screws, is placed the usual packing-washer S.

Within said neck *x* of the valve A is fixed a metallic plug *c*, (see Figs. 1 and 3,) preferably of brass. Said plug is either driven tightly into said neck *x* or secured therein by sweating the adjoining surfaces together in a well-known manner, whereby said plug is so tightly fixed in said neck that no water can leak between the latter and the plug. The said plug *c* has a longitudinal water-passage *w* through it, as shown, and its inner end is preferably of concave formation, as illustrated in Figs. 2 and 3. Said valve A is provided with a second neck *k* on the opposite end of the valve to that on which said neck *x* is located, said neck *k* having an internal passage therethrough communicating with the central portion of the body of the valve, which is in line with the passage through said neck *x*, in which is located said plug *c*. Said neck *k* has an internally-screw-threaded sleeve *m*, rigidly fixed therein, as shown. A valve-spindle *f*, having a head *g* thereon, by which it is rotated, has a screw connection with said sleeve, as shown. A valve-rod *d* is rigidly secured by one end to the end of said spindle *f* and extends longitudinally from said spindle through and within the body of said valve A. The said valve-rod *d* has its extremity or head *v* of slightly less diameter than the main part of the rod in order that it may pass through the water-passage *w* of said plug *c* to the operative position of said valve-rod, which is illustrated in Fig. 3, and for another purpose below described. The diameter of said valve-rod between said head *v* and the body thereof is reduced at *i*, as shown in said last-named Fig. 3 and in Fig. 2, and the portion *r* of said valve-rod is that part thereof which constitutes the valve-face of the rod, which has a contact against the border *z* around the inner extremity of said passage through the plug *c*, whereby the flow of water through said passage may be varied or be entirely shut off at pleasure. The said reduced diameter of said valve-rod at *i*, between said head *v* and the main portion of said rod, provides for a free flow of water through said passage while the said head *v* is maintained in position in advance of said plug. As above set forth, the said head *v* of the valve-rod *d* is of such diameter that it may pass through said plug *c*, but at the same time may have an abrading effect upon the wall of said passage *w*, to the end that said head, when moved longitudinally through said passage,

may serve to scrape off any deposit or accumulation thereon occasioned by the condition of the water as to its impurity which may have passed through said passage. A rubber or other similar packing *t* is inserted in valve A, through which the said valve-rod passes. In one side of the body of said valve A is screwed a nipple D, to which is connected by a union-nut *b* a conducting-pipe B, leading from said valve to water-clarifying devices, as below described.

A receiving-tank 3 has located thereabove a jar 4, preferably of glass, having a discharge-outlet through the bottom thereof, whereby water received therein is conducted into said tank 3. In said jar 4 is placed, first, a bed of crushed quartz or garnet 6, then above that a thick layer of animal charcoal 7, and above the latter, if desired, may be placed another layer of crushed quartz. A reservoir 8 is located above said jar 4 and connected therewith by a pipe 9. Within said reservoir 8 is a removable wire-gauze strainer, (shown in dotted lines and indicated by 10,) and this last-named strainer is packed with crushed quartz and the said outlet-pipe B from said valve A connects the latter with said reservoir 8, whereby water, which is permitted to flow through said valve, is conducted to said reservoir, and it flows successively through the filtering and clarifying devices contained therein, and thence into and through the said jar 4 and the additional filtering and clarifying devices contained in the latter, and thence into the said receiving-tank 3 for the filtered and clarified water, from whence it is drawn for use.

It is well known that for the perfect filtration and clarifying of water by whatever substance it be effected it is necessary that the flow of water to and through said substance must be regular and very gradual, and to this end the above-described valve devices are provided and the operation thereof is as follows: Before the water is let into the said filtering-jars and substances contained therein the valve-faced portion *r* of the valve-rod *d* is in contact with the border *z* of the passage *w* through said plug *c*, said border *z* constituting in effect the valve-seat of the device. Consequently the valve is thus shut and no water can flow therethrough. By unscrewing the valve-spindle *f* slightly the said valve-face of rod *d* is moved from its seat, and owing to the small diameter of the contact-surfaces of the valve and its seat (Fig. 2 illustrates substantially the actual dimensions of said valve and valve-seat parts as employed in practice) the flow of the water therebetween is so regulated that it may be caused to flow only drop by drop into the said reservoir 8, and thence through the succeeding jar 4, or more rapidly to any degree consistent with the size of the water-passage through said plug *c* and the head under which the water is supplied through pipe C. When the water-passage *w* through plug *c* shall become foul for the reason above given, the extremity *v* in the valve-rod *d* is moved back and forth through said passage in plug *c* by turning the valve-spindle *f*, and said head *v* of the valve-rod is thus rotated during its longitudinal movement in said passage, and thus the latter has any substance removed that may be adhering to its walls by permitting the water to flow freely therethrough for a few moments during the said movement of the head *v* of the valve-rod therein. When the passage or the interior of valve A is cleaned, as described, pipe B is temporarily disconnected from said valve, thus letting the foul water and impurities flow off through the neck D.

Thus it is seen that by the employment of the above-described apparatus the flow of water through the filtering material may be regulated with the greatest accuracy and according to the normal condition of the water as to purity, thereby obtaining the most advantageous purifying results.

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

1. In a device for filtering and clarifying water, a valve having a longitudinal inlet water-passage therein, on the inner end of which is a valve-seat, combined with a valve-rod normally extending through said passage and having a head on its free end for abrading action upon the wall of said passage, a valve-surface thereon for engagement with said seat, and that portion thereof between said head and valve-seat of a reduced diameter, a revoluble spindle fixed to said rod having a screw connection with said valve whereby a longitudinal movement is imparted to the free end of said rod within said passage, water-filtering devices substantially as described, and connections uniting said valve and filtering devices, substantially as set forth.

2. In a device for filtering and clarifying water, a valve having a longitudinal inlet water-passage therein, on the inner end of which is a valve-seat, combined with a valve-rod normally extending through said passage, and having a head on its free end of slightly less diameter than said water-passage, a valve-surface thereon for engagement with said seat, and that portion thereof between said head and seat of reduced diameter whereby water may flow therebetween, a revoluble spindle to which one end of said rod is fixed, having a screw connection with said valve whereby a longitudinal and revoluble movement is imparted to the free end of said rod within said passage, water-filtering devices substantially as described, and connections uniting said valve and filtering devices, substantially as set forth.

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