(No Model.)

F. J. MITCHELL.

APPARATUS FOR REGULATING THE FLOW OF LIQUIDS.

No. 441,681. Patented Dec. 2, 1890.

Fig. 2.

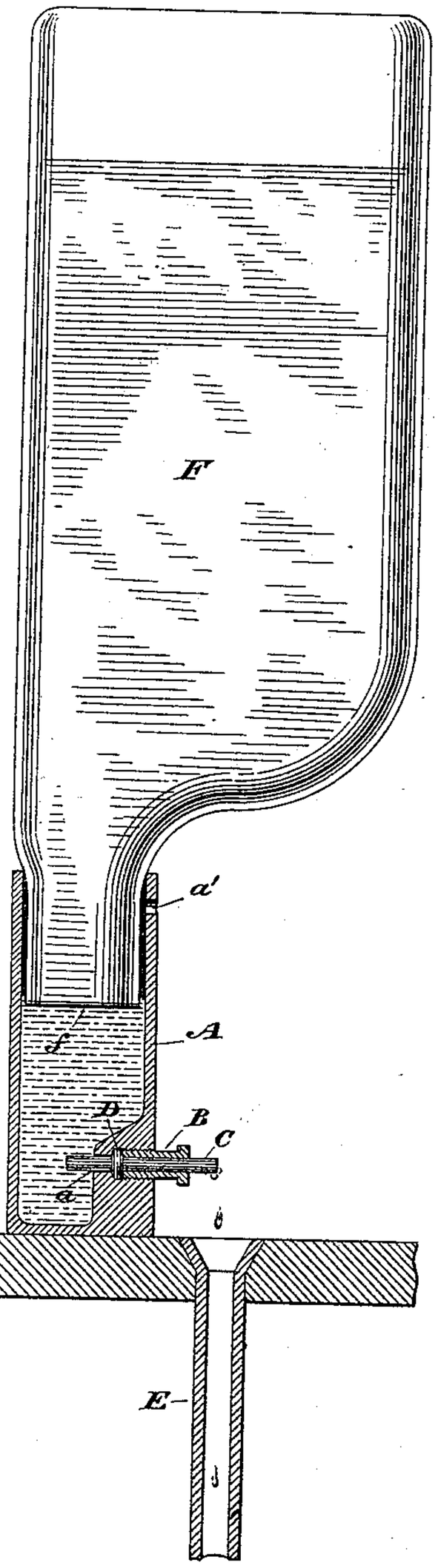
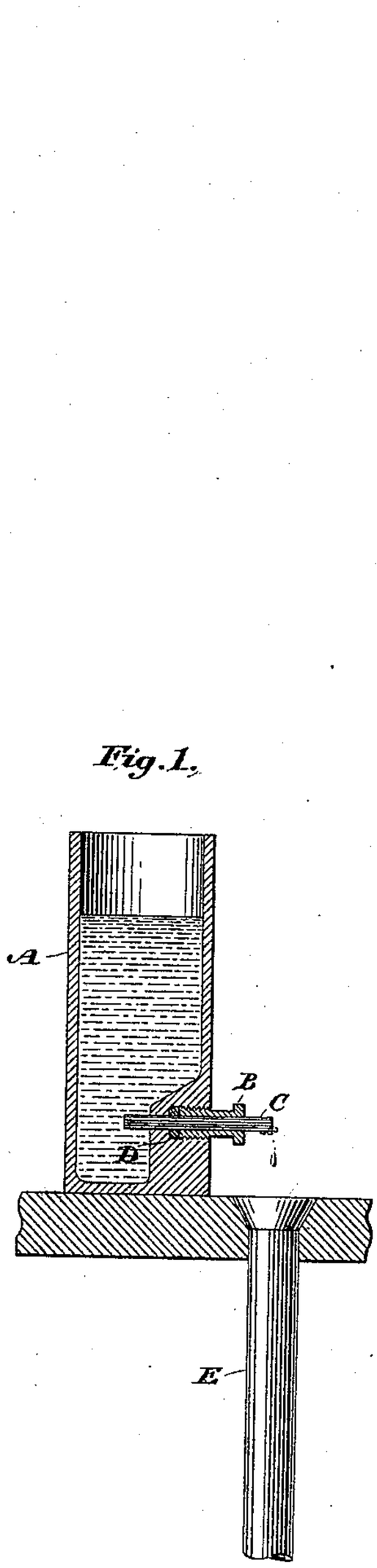


Fig. 1.



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APPARATUS FOR REGULATING THE FLOW OF LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 441,681, dated December 2, 1890.

Application filed December 20, 1889. Serial No. 334,400. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK JAMES MITCHELL, a citizen of the United States, and a resident of the city, county, and State of New York, have invented a certain new and useful Improvement in Apparatus for Regulating the Flow of Liquids, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

The object of my invention is to provide a simple and efficacious means of controlling the rate at which liquid will flow from a vessel or reservoir; and the invention consists, primarily, in providing such vessel with an outlet or spout composed of vitreous or mineral fibers.

It consists, further, of means for imparting a variable circumferential pressure to such fibers, whereby the interstices between the fibers may be increased or diminished in size, so that the rate of flow of the liquid between the fibers will be correspondingly increased or diminished; and it consists, further, of means for maintaining the liquid in the vessel at a substantially constant head or pressure.

In the accompanying drawings, Figure 1 is a sectional elevation of a liquid-holding vessel embodying my invention, and Fig. 2 is a sectional elevation of such a vessel in connection with an auxiliary feeding-reservoir.

Similar letters of reference are used to designate corresponding parts in both views.

The liquid-holding vessel A is provided with an aperture *a*, extending through the side thereof and adapted to receive the screw-threaded follower B. Extending through the follower B and through the aperture *a* to the interior of the vessel A is a bundle of fibers of a vitreous or mineral substance C, such as spun-glass or asbestus. These fibers C are surrounded by an elastic washer or packing D, which holds the fibers in position and exerts normally only a very slight circumferential pressure on the bundle of fibers. The inner side of the washer D rests against a shoulder formed in the aperture *a*, and when the follower B is screwed up against it the washer is compressed between said shoulder and the end of the follower, and the circumferential pressure of the washer on the fibers is increased, thereby effecting a more intimate contact between the fibers C. A receptacle E receives the liquid which flows from the vessel A.

The operation of my invention is obvious. When the fibers C are subjected only to the normal pressure of the washer D, the liquid in the vessel will flow through the interstices quite freely, owing partly to capillary attraction and partly to the head of liquid in the vessel. As the circumferential pressure on the fibers is increased by screwing in the follower B, the liquid will pass through less freely, and can be entirely stopped by turning the follower sufficiently.

My invention is particularly adapted for regulating the flow of liquids where it is necessary that the rate of flow should be small but regular. In such cases, with the devices heretofore employed, the sluggishness of the current has permitted a sedimentary deposit therein, which in a short time obstructed the flow. With my device, however, the interstices between the fibers are each so small that sediment will not enter into any one of them, and their combined area is sufficient to permit the requisite rate of flow.

Under some circumstances it is desirable to supply the vessel A from an auxiliary or feeding reservoir—as, for instance, where the apparatus must operate for a considerable length of time without attention. If the liquid were all contained in the vessel A, the differences in head resulting from changes in the level of the liquid would produce a corresponding variation in the rate of flow. To meet the requirement above referred to, I provide an auxiliary or feeding reservoir F, which may be of much greater capacity than the vessel A. The reservoir F, being filled, is inverted and the open mouth *f* thereof is inserted in the vessel A, into which the liquid flows and rises above the mouth *f* of the auxiliary reservoir F, thus sealing the contents of the latter to the atmosphere, it being understood, of course, that the upper end of reservoir F is closed. As the liquid in the vessel A is in communication with the atmosphere—as, for instance, through the vent *a'*—the level of the liquid in the vessel A will remain prac-

tically constant until the contents of the reservoir F are exhausted.

Although I do not limit myself thereto, the particular use for which I have heretofore employed my invention, and one wherein its advantages are well shown, is in the "germicide" disinfecting system. In such system a small but regular flow of of disinfecting liquid—such as a concentrated solution of chloride of zinc—is required, and by the use of my invention such flow is maintained constantly and regularly without the clogging of the apparatus, which has heretofore been unavoidable.

When using my invention in the germicide system, I usually employ the auxiliary feeding-reservoir, as shown in Fig. 2. This reservoir contains sufficient liquid to last for a long time, and the necessity of frequently inspecting and replenishing the apparatus is therefore avoided. The liquid flowing through or between the fibers C is delivered into any suitable vessel or receptacle—such as E—and is thence conducted to the point to which it is to be applied.

Having thus described my invention, I claim—

1. A vessel adapted to contain liquid provided with a spout composed of fibers of vitreous or mineral substance so arranged that the liquid in the vessel will flow out through said fibers in the direction of their length, substantially as and for the purposes set forth.

2. A vessel adapted to contain liquid and provided with a spout composed of fibers of a vitreous or mineral substance and with mechanism for maintaining a constant circumferential pressure on said fibers, substantially as set forth.

3. The combination, with a vessel adapted to contain liquid, of a spout composed of fibers of a vitreous or mineral substance, a washer surrounding said fibers, and an adjustable follower arranged to bear against said washer, substantially as and for the purposes set forth.

4. The combination of a vessel adapted to contain liquid and provided with a spout composed of fibers of a vitreous or mineral substance, with an auxiliary feeding-reservoir, the contents of which are sealed to the atmosphere, substantially as shown and described.

5. The combination, with a vessel adapted to contain liquid, of a spout composed of fibers of a vitreous or mineral substance, a washer surrounding said fibers, an adjustable follower arranged to bear against said washer, and an auxiliary feeding-reservoir F, substantially as and for the purposes shown and described.

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