A. F. KRAUSE.

VACUUM CLEANING APPARATUS.

APPLICATION FILED MAR. 5, 1909.

955,810. Patented Apr. 19, 1910.

Fig. 2.

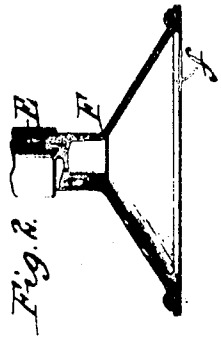
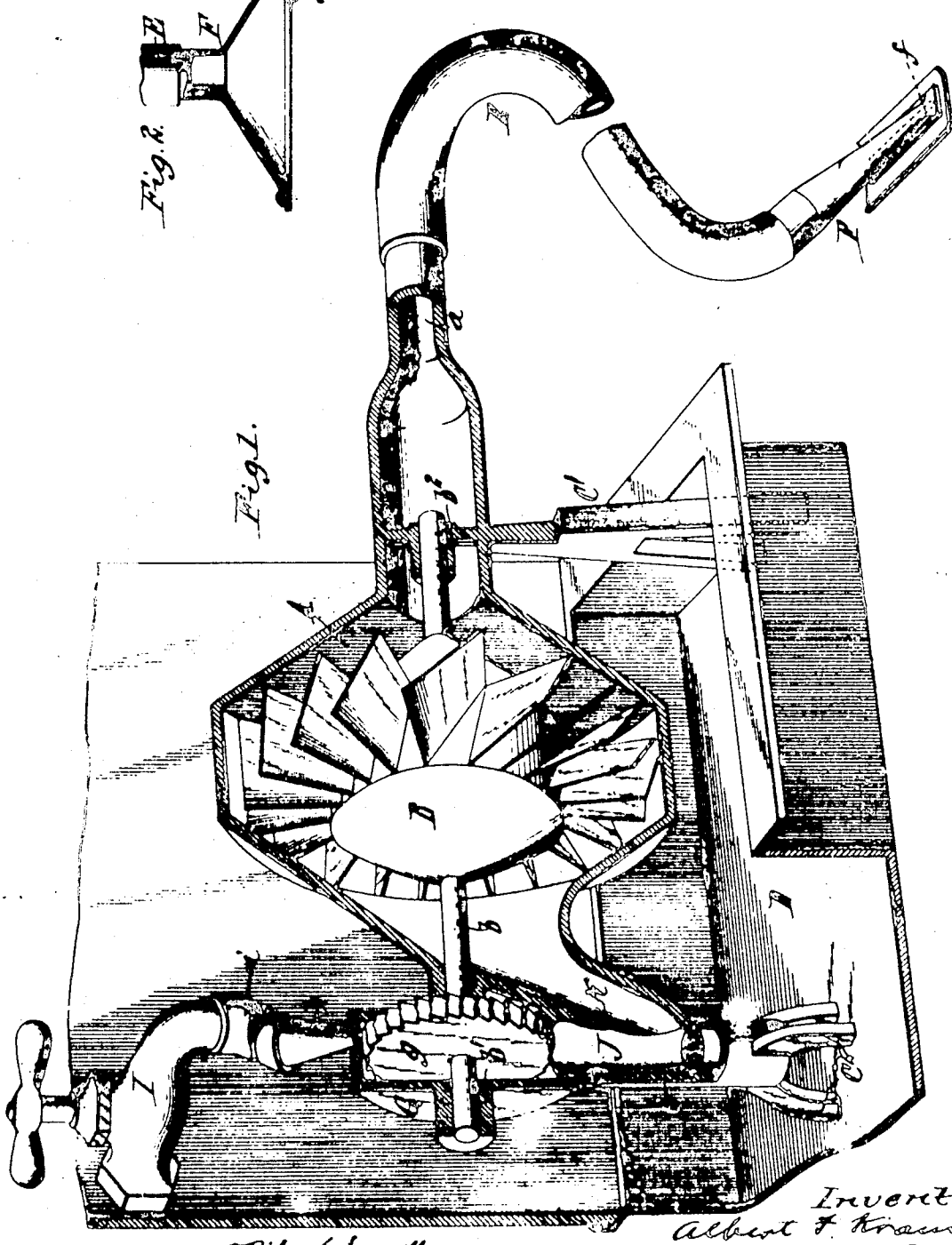


Fig. 1.



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UNITED STATES PATENT OFFICE.

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VACUUM CLEANING APPARATUS.

955,810. Specification of Letters Patent. Patented Apr. 19, 1910.

Application filed March 5, 1909. Serial No. 481,271.

To all whom it may concern:

Be it known that I, ALBERT F. KRAUSE, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Vacuum Cleaning Apparatus, of which the following is a specification.

This invention relates to a vacuum cleaning apparatus designed more particularly for household use and adapted to be operated by water-power. The cleaners now generally employed for this purpose are objectionable in that they necessitate the handling of the dust and other accumulations which are discharged into dust-collectors or receptacles with which they are usually provided. Moreover, such dust collectors or separators do not thoroughly separate the dust from the air, and some of the dust therefore finds its way back into the room, when the machine is of the portable type suitable for household use. Furthermore, the larger cleaning machines and apparatus now in use are so complicated and expensive as to be beyond the reach of the ordinary householder, while those of the smaller hand-operated type require two persons to properly operate them, one to actuate the pump and the other to guide the nozzle.

One of the objects of my invention is the provision of a vacuum cleaner which obviates the necessity of handling the dust accumulations in any form, and which is not liable to become clogged.

Further objects are the production of a compact and portable cleaner which can be operated by water power which is generally available in dwelling houses; which can be produced at a figure to bring it within the reach of the ordinary household, and which is so simple in construction and reliable in operation that it can be put in service and used by persons ordinarily unskilled in the use of machines.

In the accompanying drawings Figure 1 is a sectional perspective view of an embodiment of the cleaning apparatus. Fig. 2 is a longitudinal section of the nozzle.

Similar letters of reference indicate corresponding parts in both views.

A indicates a stationary suction or vacuum chamber containing a rotary suction fan B and mounted upon standards or pedestals C, C^2 by which it is supported in a sink D, or a tub or similar receptacle connected with a drain or sewer. The shaft *b* of the fan is preferably horizontal and journaled in suitable bearings b^1, b^2. The suction chamber A is provided at its suction side with a reduced extension or inlet tube *a* to which is connected a hose or flexible conduit E terminating in a suitable nozzle F. The nozzle shown in the drawings by way of example, is flared and provided with a laterally-extended face-plate having upturned front and rear edges and a narrow longitudinal inlet slot *f*. This nozzle is moved over the carpet or other surface to be cleaned, in a well-known manner.

g indicates a liquid motor or water wheel mounted on the fan-shaft *b* and arranged in a case G preferably mounted at the upper end of the pedestal C.

h indicates a jet-nozzle which enters the motor casing at the proper angle to direct a water-jet against the buckets of the wheel G for driving the same and the suction fan, or equivalent exhaust device. This jet-nozzle may be connected with any available source of liquid under pressure. When the apparatus is used for instance in a dwelling house, this nozzle may be connected with the usual faucet I of the service-pipe by a detachable hose *i* or other suitable conduit.

Connected with the discharge side of the motor case G is a mixing chamber or tube J which is preferably formed by the hollow or tubular pedestal C, which latter is open at its lower end and elevated by feet C^2, so as to discharge the dust-laden water into the sink D or other receptacle in which the apparatus is placed or with which the delivery end of the mixing tube may be connected.

k indicates a dust-tube or conduit connecting the discharge side of the suction chamber A with the mixing tube J.

In the use of the apparatus, upon admitting the motive liquid to the motor case G, the motor wheel is rapidly rotated, driving the fan in the proper direction to create a partial vacuum in the chamber A and a suction current through the cleaner-nozzle F and the conduit E. The dust removed from the carpet or other surface to which the nozzle is applied, is drawn into the fan case whence it is delivered by the fan through the connection *k* into the mixing tube J, where the dust is commingled with the spent water from the motor-case, the

mixture of dust and water being discharged into the sink and thence into the sewer, while the air freed from dust escapes from the lower end of the mixing tube into the room. The water thus mixes with and effectually lays all dust and dirt drawn into the apparatus, ultimately flushing it into the sewer and preventing the dust from returning into the apartment.

As the suction conduit E and the mixing chamber J are located on opposite sides of the fan or equivalent exhaust device B, the dust laden air is not moistened or mixed with water until after it has passed the exhaust device. This arrangement obviates clogging of the exhaust device by wet dust and consequent retarding or stoppage thereof, which would be liable to occur if the dust laden air were moistened before reaching the exhaust device.

Aside from its sanitary advantages, this improved apparatus collects no dust and therefore avoids the necessity of handling or removing dust-accumulations from time to time, rendering its use very convenient.

The simplicity and compactness of the apparatus, combined with its capacity for operation by water power, renders it especially suitable for use in dwelling houses, its moderate cost bringing it within the reach of ordinary households. It is moreover small, light and portable and can therefore be conveniently placed in a sink or tub for use, and readily removed and stored in a small space when not in use. A further advantage of the apparatus is that it is constant in action, increasing its efficiency over that of intermittent-action machines employing reciprocating pumps.

Various changes or modifications coming within the scope of the appended claims can obviously be made, and I do not therefore wish to be limited to the particular constructions herein shown and described.

I claim as my invention:

1. A vacuum cleaner, comprising a water motor, a dust and water mixing chamber arranged to receive the water from said motor, a suction conduit, and an exhaust device arranged between said suction conduit and said mixing chamber and operated by said water motor, said exhaust device being connected with the suction conduit and the mixing chamber.

2. A vacuum cleaning apparatus, comprising a suction chamber, a suction fan therein, a water wheel for driving the fan, a case inclosing said wheel, a mixing tube connected with the discharge sides of the suction chamber and said wheel-case, and a suction conduit connected with the inlet side of the suction chamber.

3. A vacuum cleaning apparatus, comprising a suction chamber, a suction fan therein, a water wheel for driving the fan, a case inclosing said wheel, a combined discharge and mixing tube leading from said wheel-case, a dust conduit connecting the discharge side of the suction chamber with said mixing tube, and a suction conduit connected with the inlet side of the suction chamber.

Witness my hand this 26th day of February, 1909.

ALBERT F. KRAUSE.

Witnesses:

C. F. GEYER,

E. M. GRAHAM.