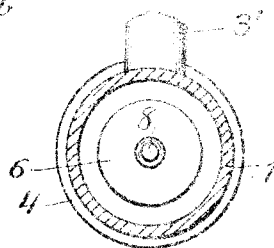
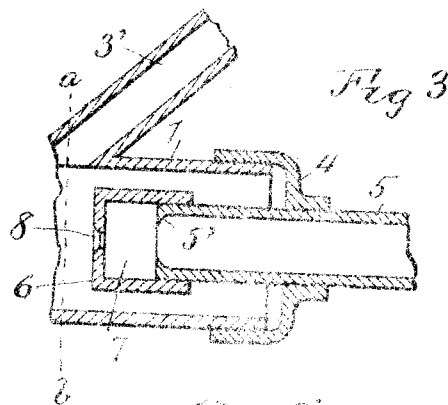
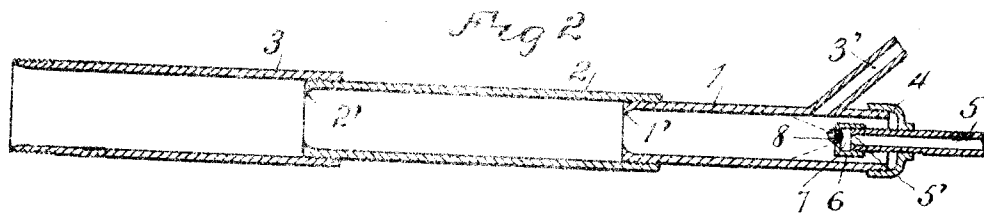
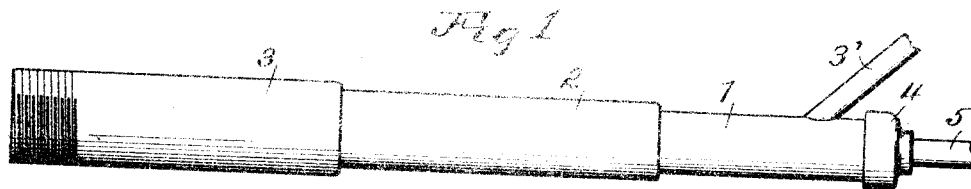


E. A. SCHENCK.  
 VACUUM PRODUCER.  
 APPLICATION FILED MAR. 1, 1911.

1,108,247.

Patented Aug. 25, 1914.



WITNESSES:

*R. Hamilton*  
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 BY *Warren D. House*  
 His ATTORNEY.

# UNITED STATES PATENT OFFICE.

EUGENE A. SCHENCK, OF KANSAS CITY, KANSAS, ASSIGNOR OF ONE-HALF TO FRANK  
HAGERMAN, OF KANSAS CITY, MISSOURI.

VACUUM PRODUCER.

1,108,247.

Specification of Letters Patent.

Patented Aug. 25, 1914.

Application filed March 1, 1911. Serial No. 511 627.

*To all whom it may concern:*

Be it known that E. EUGENE A. SCHENCK, a citizen of the United States, residing at Kansas City, in the county of Wyandotte and State of Kansas, have invented certain new and useful Improvements in Vacuum-  
Producers, of which the following is a specification.

My invention relates to improvements in vacuum producers.

The object of my invention is to provide a device by which a partial vacuum may be quickly, economically and conveniently produced for any desired purpose.

In the accompanying drawings which illustrate the preferred form of my invention, Figure 1 is a side elevation of the device. Fig. 2 is a central longitudinal sectional view of the same. Fig. 3 is an enlarged central longitudinal sectional view of the inlet end of the barrel and parts connected therewith. Fig. 4 is a cross section on the line *a-b* of Fig. 3.

Similar reference characters denote similar parts.

The barrel is preferably formed of a plurality of sections 1, 2 and 3 having internal diameters increasing toward the discharge end of the barrel, which is the left end of section 3, as viewed in Figs. 1 and 2. The discharge ends of sections 1 and 2 are preferably choke bored at 1' and 2' respectively. The barrel is preferably provided in the side of section 1 with an air inlet 3', which preferably inclines toward the discharge end of the barrel. The inlet end of the section 1 is preferably closed by a cap 4 having an axial hole through which extends and is fitted a longitudinal conductor comprising a pipe 5, preferably externally screw threaded at its discharge end on which is adjustably mounted a screw threaded cap 6, the internal diameter of which is preferably greater than the bore of the pipe 5, thus providing in the cap 6 a chamber 7 into which fluid from the pipe 5 may expand. The discharge end of the pipe 5 is preferably choke bored at 5'. The choke bored portion 5' of the pipe 5, as shown in Figs. 2 and 3, is preferably concavely curved at the inlet side thereof, and terminates in a sharp knife edge, by means of which construction the water is finely broken up as it is discharged into the chamber 7. The cap 6 is provided axially with an opening

8 the outer end of which is flaring and the inner end of which has parallel walls and is of less diameter than the choke bored portion of the pipe 5. Preferably the inlet 3' is located forward of the forward end of the cap 6. The relative diameters of the section 1, cap opening 8, and choke bored portion 5' are such that with the proper pressure of fluid in the pipe 5, the jet formed by the cap 6 will expand to the walls of the section 1 and will have contact with the said walls forward of the air inlet 3', as indicated by the dotted lines in Fig. 2.

In the operation of my invention, it is but necessary for fluid at the proper pressure to be turned into the pipe 5. For this purpose the pipe 5 may be connected to the water system, such as is provided in houses having a city water supply. When the water is admitted into the pipe 5 it will pass therefrom into the cap 6, and from thence will be discharged in a jet which by reason of the relative sizes of the section 1, the cap 5, opening 8 and choke bored portion 5', and the relation of the parts to each other, will expand and strike the inner walls of the section 1 forward of the air inlet 3'. The force of the jet will start a flow of mixed vapor and air toward the discharge end of the barrel. At the choke bored place 1' the current will be contracted, it will then expand upon entering section 2 and will be again contracted, at choke bored place 2', but not so much as at the contracted place 1'. After passing the contracted place 2' the current will again expand upon entering the section 3.

I have found that by a proper adjustment of the cap 6 on the pipe 5 and by consecutively expanding and contracting the current of mixed vapor and air passing through the barrel, that a powerful suction through the air inlet 3' may be obtained. This suction may be employed for vacuum cleaning purposes, suitable devices for effecting this, not shown, being attached to the air inlet 3'. The discharge end of the section 3 of the barrel may, if desired, be attached to a waste pipe, such as a drain pipe of an ordinary house sewer system. The dust, dirt, sweepings, etc., which are sucked into the air inlet 3' will thus be carried off into the sewer without being handled. The amount of water required to be used is comparatively

small and is productive of little expense, while the dirt is disposed of in a sanitary manner.

It is important that the jet issuing from the cap 6 fills the section 1 from wall to wall, thus preventing any back flow of air. The choke bored places 1' and 2' assist in preventing any back flow of air. Furthermore the jet must be so finely atomized that the passage of air backwardly between the particles will be prevented. With an ordinary city water pressure, I have found that by employing an opening 8 of three sixteenths inches diameter in its smallest part, and a section 1 of one and a half inches inside diameter, a strong flow of air will be caused to pass through the air inlet 3' into the barrel. Of course, if the jet issuing from the opening 8 should flow down the barrel without expanding to the side walls thereof, no appreciable suction of air would be effected, no matter what pressure would be employed to drive the jet. For this reason, as I have stated, it is important in the operation of the device to secure proper adjustment of the cap 6 on the pipe 5, for a slight variation of adjustment alters the character of the jet and reduces or increases its efficiency. The cap 6 should, therefore, be adjusted to suit the particular pressure of water employed.

The choke bored places 1' and 2' should preferably be free from roughness. I have found that by having such portions curved and terminating in knife edges as shown in Fig. 2, the best results are obtainable. The outer ends of sections 1 and 2, that is, the ends at the left, as viewed in Fig. 2, may be squared, so as to permit a quick expansion of the current passing from said sections. I have found by practical demonstration that the choke bored portions 1' and 2' exert a material influence in determining the suction through the air inlet 3'. I have also found by practical demonstration that by having the barrel increase in diameter toward the discharge end is a material advantage over a barrel of one diameter throughout.

The air inlet may be disposed forward of the position shown in the drawings, or it may be to the rear of that position, but I have found the best effects obtained when the air inlet is located, as shown, between the cap 6 and the place where the jet impinges against the wall of the section 1. Where the air inlet is located wholly forward of the jet producer, the device is self cleaning, which is not the case where the air inlet is partly or wholly to the rear of the jet producer. By having said inlet inclined toward the discharge end of the barrel, as shown, it may be readily cleaned, if it should become clogged by the dirt drawn therethrough.

With the use of my invention a house may

be economically equipped for vacuum cleaning, and after being so equipped, it may be economically and conveniently cleaned and the refuse disposed of without handling and in a sanitary manner.

I do not limit my invention to the structure illustrated and described, as many modifications and changes, within the scope of the appended claims, may be made without departing from the spirit of my invention.

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

1. In a suction apparatus, the combination with a fitting adapted to be connected with a supply system and having a suction branch communicating therewith intermediate the pressure and discharge end, of a spray nozzle located within the fitting at the pressure side of the opening of the suction branch and embodying two parallel fixed diaphragms with a distance chamber between and having central openings therein whose areas are less than the areas in cross section of the adjacent parts of the fitting and the distance chamber, whereby a vacuum spray is produced.

2. A vacuum producer having a barrel open at its discharge end and having an air inlet, and a conductor for conveying fluid under pressure and having means for discharging a jet lengthwise into the barrel toward its discharge end, the barrel being choke bored at a place between the place of entrance of the jet and the discharge end of the barrel, the internal diameter of the barrel at the discharge side of said choke bored place being greater than at the inlet side of said choke bored place.

3. A vacuum producer having a barrel open at its discharge end and having an air inlet, and a conductor for conveying fluid under pressure and having means for discharging lengthwise into the barrel toward its discharge end a jet which expands laterally to the walls of the barrel, the barrel being choke bored at a place between the place of contact of the jet with the walls and the discharge end of the barrel, the internal diameter of the barrel at the discharge side of the choke bored place being greater than at the inlet side of said choke bored place.

4. A vacuum producer having a barrel open at its discharge end and having an air inlet, and a conductor for conveying fluid under pressure and having means for discharging lengthwise into the barrel toward its discharge end a jet which expands laterally to the walls of the barrel, the barrel being choke bored at a place between the place of contact of the jet with the walls and the discharge end of the barrel, the internal diameter of the barrel at the discharge side of the choke bored place being greater than at the inlet side thereof, and the air inlet

being located at the rear of the place of contact of the jet with the walls.

5. In a jet former for a vacuum producer, a conductor for fluid under pressure, and a cap mounted on the discharge end of the conductor and having an internal diameter greater than that of the conductor and provided with an axial opening having a portion at its inner end of less diameter than the bore of the conductor, said portion having parallel sides, said opening being flaring at its outer end.

6. In a jet former for a vacuum producer, a conductor for fluid under pressure having a choke bored discharge end, and a cap mounted on the discharge end of the conductor and having an internal diameter greater than that of the conductor and provided with an axial opening the inner end of which has parallel sides and is of less diameter than the choke bored portion of the conductor, the outer end of said opening being flaring.

7. In a jet former for a vacuum producer, a conductor for fluid under pressure having a choke bored discharge end, and a cap adjustable lengthwise on the discharge end of said conductor and having an internal diameter greater than that of the conductor and provided with an axial opening the inner end of which has parallel sides and is less in diameter than the choke bored end of the conductor, the outer end of said opening being flaring.

8. In a jet former for a vacuum producer, a conductor for fluid under pressure having a choke bored portion concavously curved at the inlet side thereof, and having a cap at the discharge end of the conductor provided with an axial discharge opening and a chamber between the said opening and choke bored portion of greater internal diameter

than the internal diameter of the conductor at the choke bored place.

9. In a jet former for a vacuum producer, a conductor for fluid under pressure having a choke bored portion concavously curved at the inlet side thereof and terminating in a knife edge, and having a cap at the discharge end of the conductor with an axial discharge opening and a chamber between said opening and the choke bored portion of greater diameter internally than the internal diameter of the conductor at the choke bored portion.

10. In a jet former for a vacuum producer, a conductor for fluid under pressure having a choke bored portion concavously curved at the inlet side thereof, and having a longitudinally adjustable cap at the discharge end of the conductor with an axial discharge opening, the cap having a chamber communicating with the choke bored portion and with said axial opening of greater diameter than the choke bored portion.

11. In a jet former for a vacuum producer, a conductor for fluid under pressure having a choke bored portion concavously curved at the inlet side thereof and terminating in a knife edge, and having a longitudinally adjustable cap at the discharge end of the conductor with an axial discharge opening, the cap having a chamber communicating with the choke bored portion and with said axial opening of greater diameter than the choke bored portion.

In testimony whereof I have signed my name to this specification in presence of two subscribing witnesses.

EUGENE A. SCHENCK.

Witnesses:

E. B. HOUSE,

FLORENCE M. VENDIG.