C. G. CAMPBELL & M. BENBROOK.

VACUUM CREATING APPARATUS.

APPLICATION FILED MAR. 8, 1912.

Patented Feb. 18, 1913.

1,053,155.

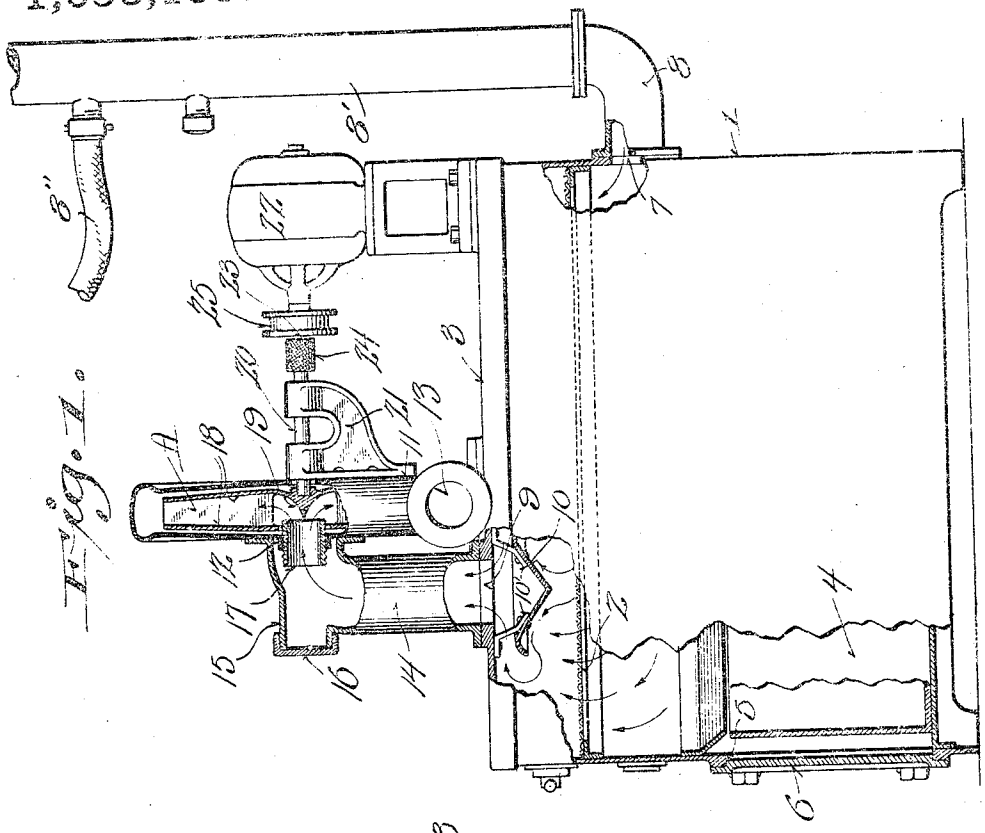

Fig. 1.

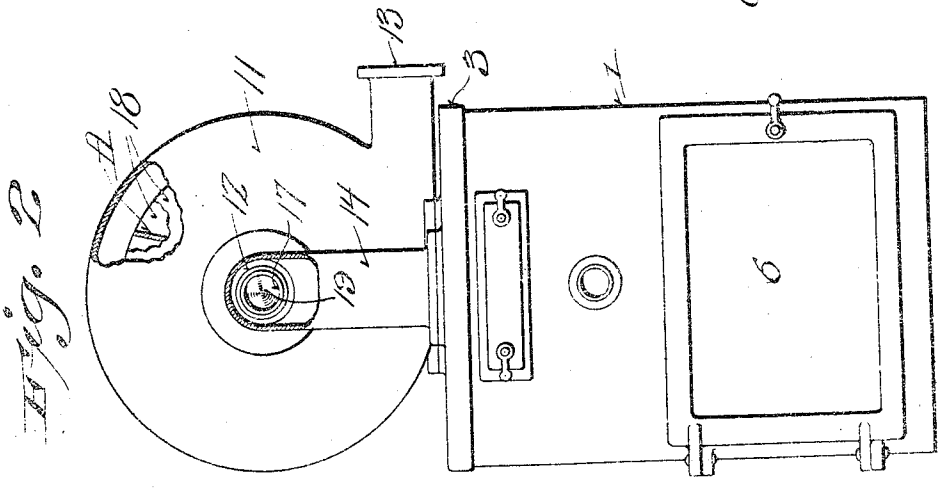

Fig. 2.

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UNITED STATES PATENT OFFICE.

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VACUUM-CREATING APPARATUS.

1,053,155. Specification of Letters Patent. Patented Feb. 18, 1913.

Application filed March 8, 1912. Serial No. 682,362.

To all whom it may concern:

Be it known that we, CHARLES G. CAMPBELL and MONROE BENBROOK, both citizens of the United States, and residents of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Vacuum-Creating Apparatus; and we do hereby declare that the following is a full, clear, and exact description thereof.

Our invention refers to vacuum cleaning apparatus, its object being to simplify the construction of said apparatus and increase its efficiency and adaptability to use of a predetermined number of suction tools simultaneously, the construction of apparatus being the same for installations of systems varying in capacity.

Specific objects of our invention are to provide a simple and economically constructed separator having its inlet opening disposed at one end of the separator and a discharge orifice that communicates with the fan at the opposite end thereof, there being interposed a screen whereby the dust laden air will be caused to travel longitudinally of the screen to more effectually settle the dust prior to the air being drawn through said screen, the said separator constituting a suction chamber; to provide a fan which is secured to the top of the dust collector and in pipe connection with its air discharge orifice, the area of which pipe and orifice is equal to or greater than the suction capacity of the fan; to provide means for adjusting the air intake opening of the fan casing within the pipe; to provide a hand-hole within the pipe whereby access may be had to the adjusting means.

Our present invention is particularly adapted for use in connection with fans such as disclosed in our application for patent for improvements in centrifugal fans, Serial Number 678927, filed February 20, 1912.

With the above and other minor objects in view the invention consists in certain peculiarities of construction and combination of parts as set forth hereinafter with reference to the accompanying drawings and subsequently claimed.

In the drawings Figure 1 represents a side elevation partly in section of an apparatus embodying the features of our invention, and Fig. 2, an end view of the same with parts broken away and parts in section.

Referring by characters to the drawings 1 represents a rectangular box-like separator having a screen partition 2 spaced from its top-plate 3, and fitted in the bottom of said separator box is a dust-receiving removable tray 4, the said tray being withdrawn through an opening 5 that is normally closed by a hinged door 6 whereby the separator is rendered air-tight.

7 indicates the air inlet opening of the separator having fitted thereto the usual elbow 8 to which is attached the usual stand-pipe, 8′, the same being provided with a plurality of openings to which are coupled one or a series of suction inlet tubes 8″, all of this construction being of the ordinary type. The top 3 of the separator, upon the opposite end thereof from the inlet opening, is provided with a discharge orifice 9 the cross-sectional area of which is equal to or greater than the cross-sectional area of the air inlet opening of said separator. This orifice is protected by a hood 10 that is suspended slightly below said orifice by means of straps 10′, the hood being preferably conical in shape and provided with a curled edge whereby the latter constitutes a deflector for dust which may be drawn toward the said orifice. Mounted upon the top-plate 3 of the separator is a fan-casing 11 of the snail-shell type, provided with an air intake opening 12 disposed eccentrically of the casing, and an air discharge opening 13 that is tangentially thereof. Secured about the air intake orifice of the fan casing and discharge orifice 9 of the separator is a detachable elbow suction pipe 14, the upper arm of which is arranged concentric to said orifice and provided with a hand-hold 15 that is normally closed by a cap 16, which cap is in threaded union therewith. By providing a detachable elbow pipe which is secured to the top of the separator and face of the fan casing about its intake orifice it is apparent that simplicity of construction and assemblage is obtained. The fan casing intake orifice 12 carries a throat-sleeve 17 which is in threaded union with the orifice whereby said throat-sleeve may be adjusted in or out with respect to a fan A, for the purpose of regulating the passage of air thereto. The fan A is provided with the usual vanes

which are interposed between a backing-plate 18, and a front plate 18′, the same being apertured and arranged to revolve about the throat-sleeve. The backing-plate 18 is also provided with a pointed conical deflector 19 whereby the direction of air which enters through the throat-sleeve is changed from a central direction to a radial with relation to said fan, this change of direction being effected by the gentle curvature of the conical deflector.

By the above described arrangement of adjustable sleeve in connection with the intake opening of the fan-casing it is apparent that after the apparatus is set up, by removal of the cap 16, said throat-sleeve may be adjusted to regulate the intake opening to the fan in proportion to the number of suction-nozzles that may be used at the same time in the operation of the device. Thus the intake orifice is predeterminedly set with respect to the number of tools to be operated whereby the amount of air drawn into the fan is limited accordingly. Hence great economy in the construction of the machine is effected due to the fact that a single machine may be designed and utilized for one or a series of suction nozzles without special construction or variations.

The fan is mounted upon the usual shaft 20 which is journaled in a bracket 21 that is connected to the fan-casing and supported upon the top-plate 3 of the separator, there being the usual motor 22 mounted upon said top-plate 3, the shaft 23 of which motor is connected to the fan-shaft by a flexible coupling 24 whereby the fan may be disconnected from said motor when it is desired to utilize the power thereof for other purposes, said motor-shaft being provided with a pulley 25 whereby power is transmitted.

We are aware that vacuum apparatus of this general character have been utilized wherein a partition between the fan-chamber and inlet opening is provided with an orifice that is substantially the same in cross-sectional area as the combined cross-sectional area of the number of openings in the stand-pipe for attaching suction-nozzles, thus limiting the amount of air which can be drawn into the fan to the amount of air which may properly be drawn through the shanks of the particular number of nozzles. This construction requires specially designed machines in each instance for accomplishing the desired result whereby our apparatus as previously described, being arranged with an adjustable air intake without respect to the cross-sectional area of the partition in the separator can be used for one or more suction-nozzles by a simple adjustment.

We claim:

1. In a vacuum creating apparatus; the combination of a suction chamber provided with a discharge opening and an air inlet opening of unrelated areas, the air inlet opening being adapted to receive a stand-pipe having a plurality of suction inlet tubes communicating therewith, a fan, a casing therefor provided with an air intake orifice, a suction pipe in communication with the chamber discharge and fan casing intake orifice, and an adjustable means incased within the suction pipe in connection with said fan intake orifice whereby the area of the latter is predeterminedly regulated relative to the number of suction inlet tubes carried by the aforesaid stand-pipe.

2. In a vacuum creating apparatus; the combination of a suction chamber provided with a discharge opening and an air inlet opening of unrelated areas, the air inlet opening being adapted to receive a stand-pipe having a plurality of suction inlet tubes communicating therewith, a fan, a casing therefor provided with an air intake orifice, a separable suction pipe having its respective ends connected to the fan casing about its intake orifice and the discharge orifice of the suction chamber, and an adjustable means incased within the suction pipe in connection with said fan intake orifice whereby the area of the latter is predeterminedly regulated relative to the number of suction inlet tubes carried by the aforesaid stand-pipe.

3. In a vacuum creating apparatus; the combination of a suction chamber provided with a discharge opening and an air inlet opening of unrelated areas, the air inlet opening being adapted to receive a stand-pipe having a plurality of suction inlet tubes communicating therewith, a fan, a casing therefor provided with an air intake orifice, a suction pipe in communication with the chamber discharge and fan casing intake orifice, and an adjustable means incased within the suction pipe in connection with said fan intake orifice whereby the area of the latter is predeterminedly regulated relative to the number of suction inlet tubes carried by the aforesaid stand-pipe.

4. A vacuum creating apparatus comprising a suction chamber having an intake orifice and a discharge orifice of unrelated areas, a fan, a casing therefor provided with an air intake orifice, a pipe in communication with the chamber discharge and fan-casing air intake orifice, and an adjustable sleeve in union with the air intake orifice of the fan for regulating the flow of air through the chamber.

5. A vacuum creating apparatus comprising a suction chamber having an inlet orifice and a discharge orifice in communication therewith, the discharge orifice being equal to or greater than the capacity of the inlet orifice, the said inlet orifice being

adapted to receive a stand-pipe having a plurality of suction-inlet tubes in communication therewith, a fan, a casing therefor having an air intake orifice, a pipe connecting the fan-casing intake orifice and discharge orifice of the suction chamber, means located within the pipe for adjusting said fan-casing intake orifice, and a cap closed hand-hole in the pipe whereby access is had to the adjusting means of the aforesaid fan intake orifice.

6. A vacuum creating apparatus comprising a suction chamber having an intake orifice and a discharge orifice of unrelated areas, a fan, a casing therefor provided with an air intake orifice, a pipe in communication with the chamber discharge and fan-casing air intake orifice, and a sleeve in threaded union with the air intake orifice of the fan for regulating the flow of air through the chamber.

In testimony that we claim the foregoing we have hereunto set our hands at Milwaukee in the county of Milwaukee and State of Wisconsin in the presence of two witnesses.

CHARLES G. CAMPBELL.
MONROE BENBROOK.

Witnesses:
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M. E. DOWNEY.