

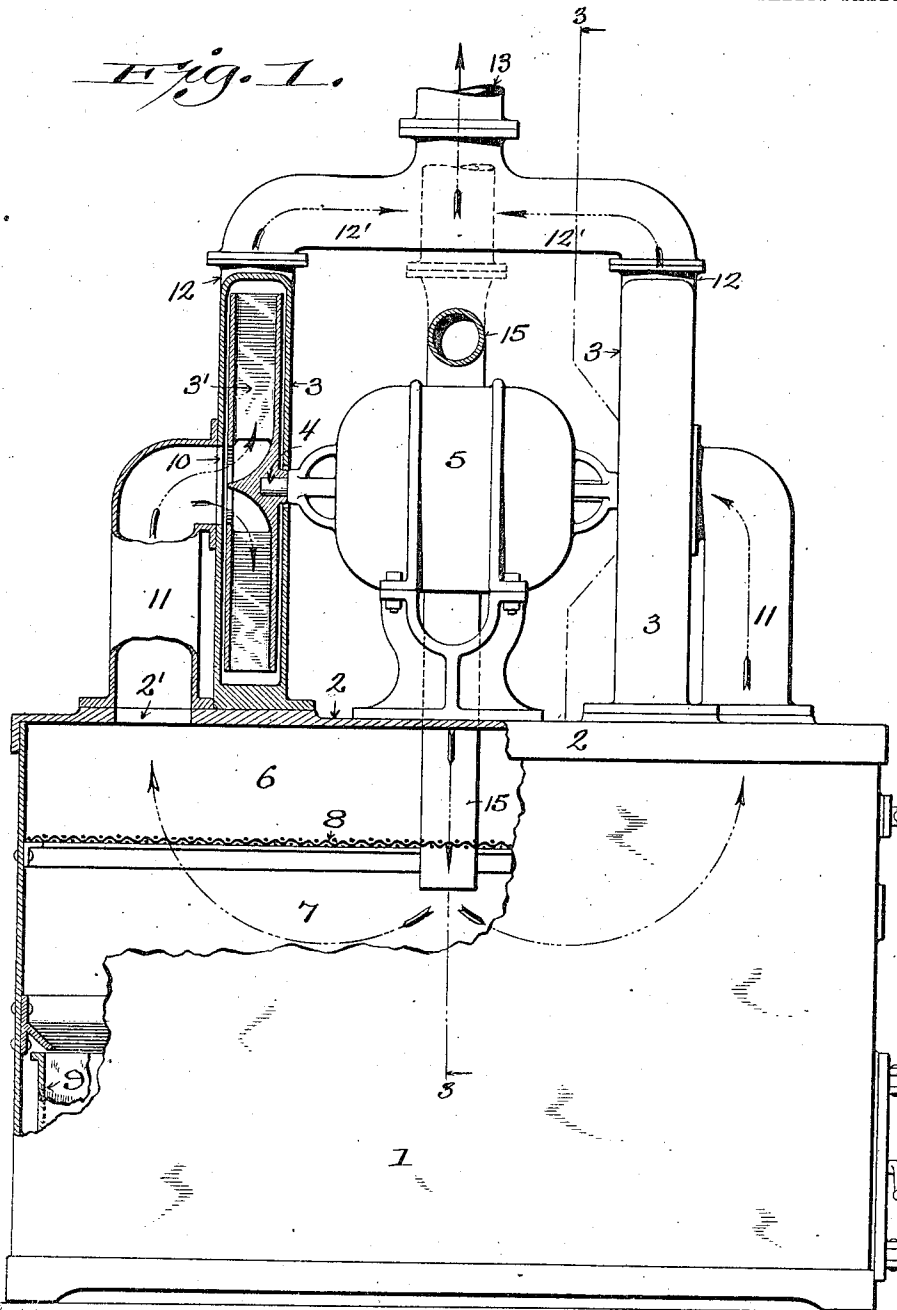
C. G. CAMPBELL & M. BENBROOK.
AIR CIRCULATING SYSTEM FOR VACUUM PRODUCERS.

1,053,156.

APPLICATION FILED AUG. 15, 1912.

Patented Feb. 18, 1913.

2 SHEETS—SHEET 1.



Witnesses:
Charles L. Campbell
Monroe Benbrook
May Downey

Witnesses:
Charles L. Campbell
Monroe Benbrook
Charles L. Campbell
Monroe Benbrook
Attorneys

C. G. CAMPBELL & M. BENBROOK.
AIR CIRCULATING SYSTEM FOR VACUUM PRODUCERS.

1,053,156.

Patented Feb. 18, 1913.

2 SHEETS—SHEET 2.

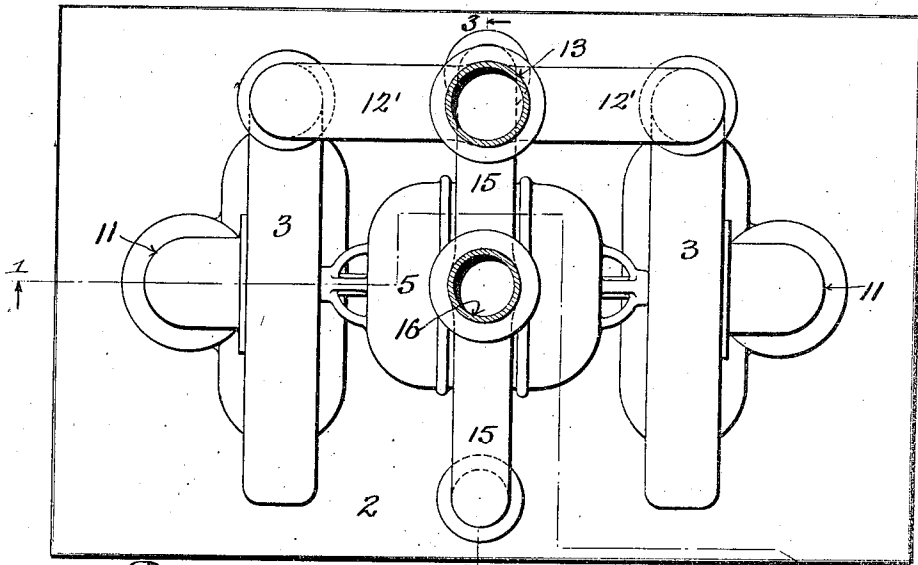


Fig. 2.

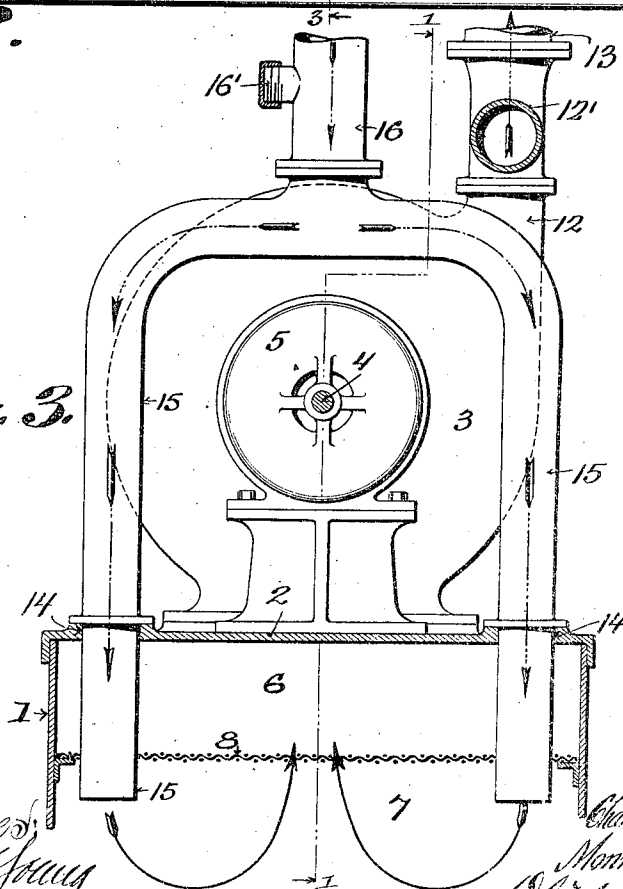


Fig. 3.

Witnessed:
Charles G. Campbell
May Downey

304

Inventors:
Charles G. Campbell
Monroe Benbrook
Witnessed:
May Downey
C. G. Campbell

UNITED STATES PATENT OFFICE.

CHARLES G. CAMPBELL AND MONROE BENBROOK, OF MILWAUKEE, WISCONSIN, ASSIGNORS TO THE CREAMERY PACKAGE MFG. COMPANY, OF CHICAGO, ILLINOIS.

AIR-CIRCULATING SYSTEM FOR VACUUM-PRODUCERS.

1,053,156.

Specification of Letters Patent.

Patented Feb. 18, 1913.

Application filed August 15, 1912. Serial No. 715,155.

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 Air-Circulating Systems for Vacuum-Producing; and we do hereby declare that the following is a full, clear, and exact description thereof.

Our invention refers to vacuum producing apparatus especially designed for use in connection with dust-collecting separators, its object being to provide a simple, economical, effective air-circulating system therefor.

The construction and arrangement of our present invention is such that back-pressure is avoided and more uniform distribution of air admitted to and exhausted from a suction chamber, which chamber is divided into upper and lower compartments separated by a screen or partition through which the air is adapted to travel, whereby the maximum suction capacity is obtained by fans of a predetermined capacity relative to the expenditure of power.

Another advantage of our novel arrangement of air distribution is that the full area of the chamber screen surface is utilized for separating the dust from the outgoing filtered air, whereby clogging of the screen at one point is avoided, resulting in an even application of the motive force to the fan elements, the apparatus as herein fully described with reference to the accompanying drawings and claimed, being particularly applicable to such devices as disclosed in an application for patent for improvements in vacuum-cleaner apparatus, filed by us March 8, 1912, Serial Number 682,362.

In the drawings Figure 1 represents an elevation of an apparatus embodying the features of our invention with parts broken away and parts in section as indicated by line 1—1 of Figs. 2 and 3; Fig. 2, a plan view of the same, and Fig. 3, a sectional elevation of the apparatus, the section being indicated by lines 3—3 of Figs. 1 and 2.

Referring by characters to the drawings, 1 represents a suction chamber provided with a cover-plate 2 that constitutes a supporting bed for a vacuum producer mechanism comprising a pair of aligned fan-casings 3, of the snail type, having fans 3'

therein, which fans are mounted directly upon the opposite ends of a shaft 4 that carries the armature of an electric motor 5, the motor being secured to the cover-plate 2 intermediate of said fan casings, through an interposed bracket. The suction chamber 1 is divided into upper and lower compartments 6 and 7 respectively by a screen-cloth partition-wall 8 that is located just below the cover-plate and parallel thereto. The lower compartment 7 of the suction-chamber 1 is provided with the usual removable dust-receiving tray 9, all of which specific chamber elements form no part of our present invention, except so far as they cooperate to accomplish the desired result in a circulating system of the character herein described.

The cover-plate 2 is provided with oppositely disposed end suction ports 2' that communicate with the upper chamber compartment 6, the ports being adjacent to the ends of said compartment. Each port is connected to a suction mouth 10 of a juxtaposed fan-casing by a hollow leg 11. The fan casings are also provided with the usual peripheral discharge leg 12, which legs in turn are connected to oppositely extended branch tubes 12', 12', of a common main exhaust pipe 13 that is open to atmosphere. The cover-plate 2 is also provided with a pair of oppositely disposed and transversely arranged apertures 14, through which apertures are fitted branch suction tubes 15 that connect to a common suction or stand-pipe 16, the same being provided with a plurality of nipples 16' for attachment to suction nozzles, not shown. The ends of the branch suction-tubes 15 extend through the upper compartment 6 of the suction chamber and also through suitable apertures in the screen partition 8 having their mouths in communication with the lower compartment 7 of said suction-chamber, whereby dust-laden air delivered from the suction tubes 15 is trapped therein.

From the foregoing description it will be seen that air is admitted at two points to the lower compartment of the suction chamber and centrally thereof, the points of air admission being adjacent to the side walls of the chamber, while the exhaust from the chamber is drawn from the upper compartment thereof at two opposite points adjacent to the end walls of the latter and above the

screen. Hence it is apparent that the dust-laden currents of air from the suction mouths of the tubes 15 will be drawn over the under side of the screen 8 in opposite directions, the air being thus broken up into thin diverging sheets coincident to its travel as it rises upward through the screen and is filtered. This filtered air is thereafter drawn off from the upper compartment of the suction chamber at its opposite ends, whereby the opposing cross-currents of air caused through the positioning of the various ports tends to more evenly distribute said air, which distribution will thus cause the entire screen surface to be utilized as a dust and air separating medium, whereas under the usual conditions all of the air is directed to a small area of the screen surface, thus choking the same, whereby not only the efficiency of the separator or suction chamber is impaired, but the suction or pulling power of the air is unduly loaded, due to back pressure or choking of the air currents.

25 With our arrangement of air circulation the above mentioned objectionable features are overcome and the apparatus, as practically demonstrated, shows an increased suction capacity relative to the motive force employed and also great efficiency in separation due to the fact of the position of the various

suction and exhaust ports in the chamber and the proportion of the various pipes or channels comprising the circulating system, whereby a free and even circulation of air is obtained, to thus prevent fluctuations in the load that is applied to a motor of a predetermined capacity.

We claim:

In a circulating system for vacuum producers; the combination of a suction chamber having a division screen therein, an exhaust pipe having branches in communication with opposite ends of the chamber above the screen, a vacuum producer interposed in each branch pipe, and an air discharge stand-pipe having branches that communicate with the suction chamber below the screen, the mouths of the branches terminating at points transversely of said screen relative to the mouths of the suction branch pipes.

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:

GEO. W. YOUNG,
M. E. DOWNEY.