G. L. BUSIAN.

VACUUM CLEANER.

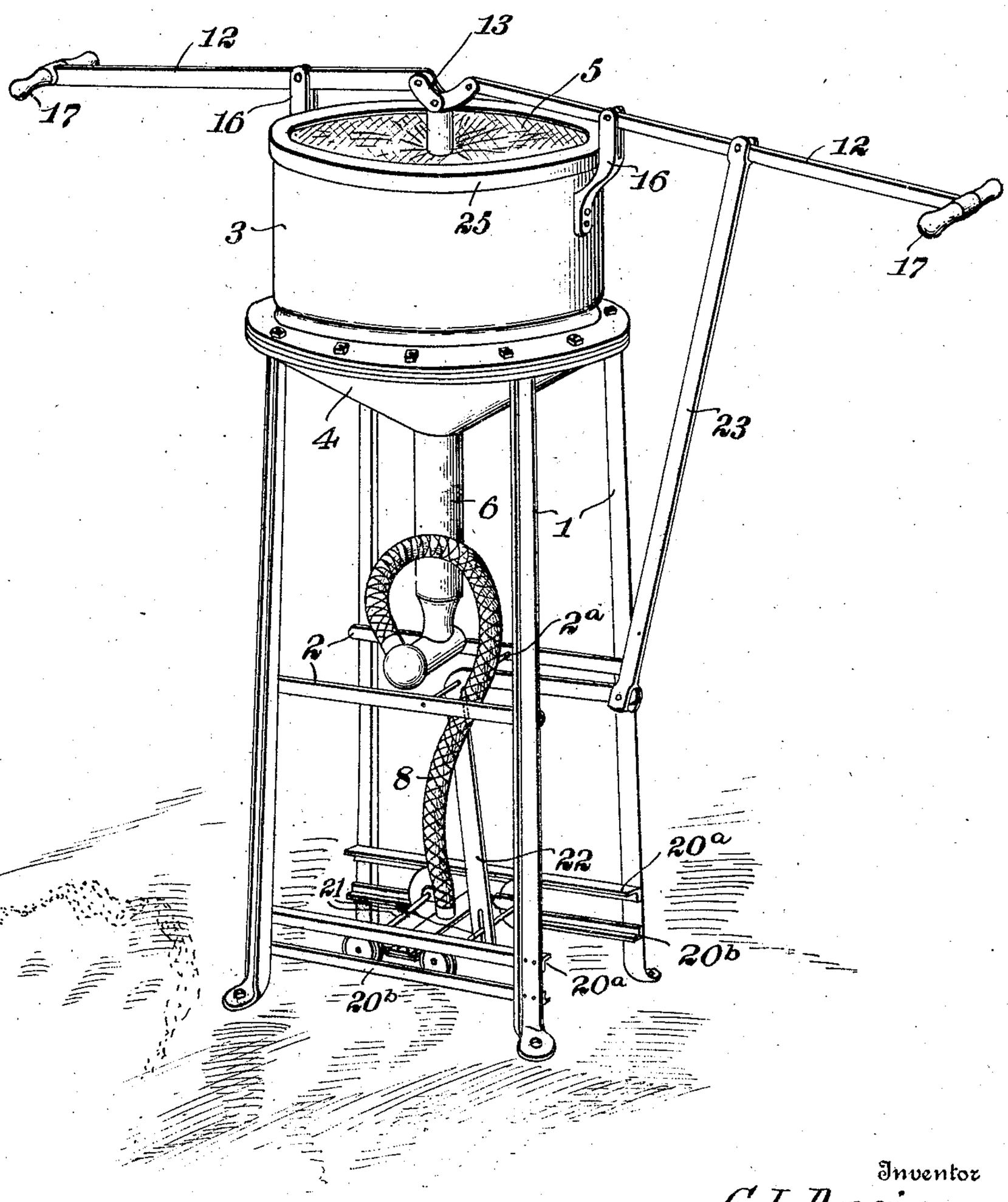
APPLICATION FILED FEB. 8, 1909.

944,944.

Patented Dec. 28, 1909.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

Inventor

G. L. Busian,

By

Attorneys

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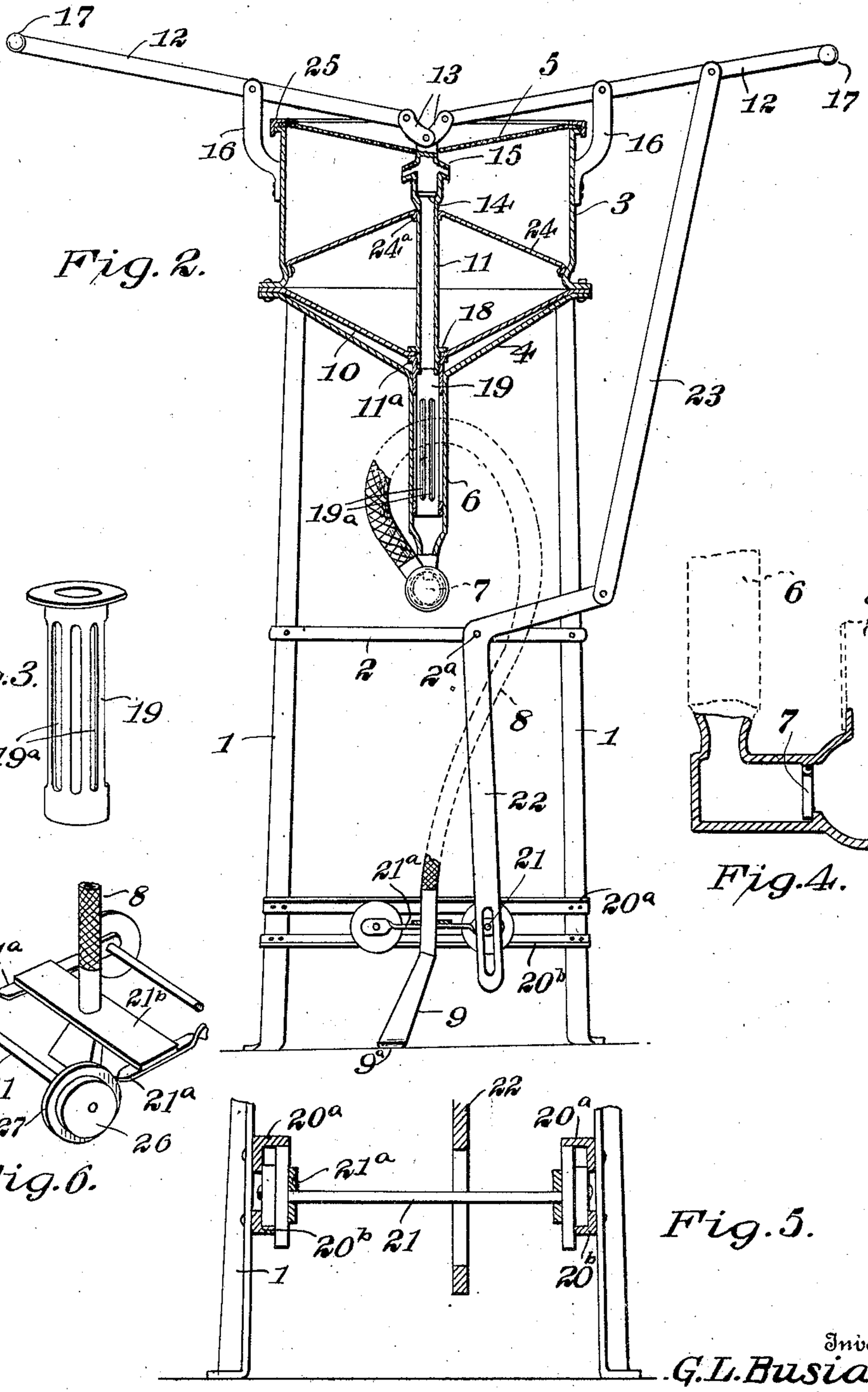

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 6.

Fig. 5.

Witnesses

Inventor

G. L. Busian,

By Howard Macy, Attorneys

UNITED STATES PATENT OFFICE.

GERHARD L. BUSIAN, OF MARSHALL, MINNESOTA.

VACUUM-CLEANER.

944,944. Specification of Letters Patent. **Patented Dec. 28, 1909.**

Application filed February 8, 1909. Serial No. 476,663.

To all whom it may concern:

Be it known that I, GERHARD L. BUSIAN, a citizen of the United States, residing at Marshall, in the county of Lyon and State of Minnesota, have invented certain new and useful Improvements in Vacuum-Cleaners, of which the following is a specification.

The present invention relates to certain new and useful improvements in vacuum cleaners, and the primary object of the invention is the provision of a device of this character embodying a novel construction whereby it can be readily operated by hand and easily transported from place to place as may be desired.

The invention further contemplates a vacuum cleaner in which the nozzle is peculiarly mounted so as to be held in a yielding engagement with the floor and automatically drawn back and forth across the same when the suction device is operated, and also in which the dust collected by the machine will not cause the machine to be clogged or in any manner interfere with the effective operation thereof.

For a full understanding of the invention and the merits thereof and also to acquire a knowledge of the details of construction and the means for effecting the result, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a perspective view of a vacuum cleaner constructed in accordance with the invention; Fig. 2 is a vertical sectional view through the same; Fig. 3 is an enlarged detached perspective view of the sleeve which is pendent from the tubular plunger; Fig. 4 is an enlarged side elevation of the lower end of the pipe projecting downwardly from the cylinder, parts being shown in section; Fig. 5 is a transverse sectional view through the track at the lower end of the frame; and Fig. 6 is a detail perspective view of the carriage and nozzle, portions being removed.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The supporting frame for the vacuum cleaner comprises a series of upright legs 1, opposite pairs of the legs being connected between their ends by a cross bar 2. Mounted upon this supporting frame is a vertical cylinder 3, the lower end of which is closed by a plate 4, while its upper end has a piece of fabric 5 stretched across the same. The plate 4 is depressed downwardly so as to have a substantially inverted conical shape, and is formed at its central portion with an opening leading to a pipe 6 which is pendent from the plate and is supported thereby. The lower end of this pipe 6 is provided with an inwardly opening check valve 7 and is connected to the flexible tube 8 which leads to the nozzle 9, the said nozzle being formed with a slot 9^a through which air and dust is designed to be drawn into the tube by means of suction. A diaphragm 10 of leather or other similar material is stretched across the lower end of the cylinder 3 and in the present instance the edges of this leather diaphragm are shown as clamped between the cylinder and the plate 4.

Attached to the central portion of the diaphragm and extending upwardly therefrom through the cylinder, is a tubular plunger 11, the said plunger being also connected to the fabric 5 and having the upper extremity thereof loosely connected to the inner ends of a pair of oppositely disposed hand levers 12 by means of the links 13. An upwardly opening check valve 14 is interposed in the length of the tubular plunger 11 and a pair of laterally projecting discharge spouts 15 are arranged upon the plunger above the check valve 14, the upper end of the plunger being closed so that any air and dust forced upwardly through the same will be discharged through the spouts 15 into the interior of the cylinder 3, the air then passing freely through the fabric 5, while the dust is retained by the fabric within the cylinder. The dust which is thus retained in the cylinder collects upon a conical plate 24 resting loosely upon an annular rib 24^a pressed inwardly from the lower end of the cylinder, the said conical plate having a central opening at its apex through which the tubular plunger passes. The dust is thus prevented from dropping upon the diaphragm 10 where it would be agitated every time the hand levers were moved. The hand levers 12 are pivotally mounted between their ends upon fulcrum members 16 secured to opposite sides of the cylinder, and are provided at their outer ends with the handles 17.

The lower end of the tubular plunger 11 is threaded at 11^a and provided with a shoulder 18 at the termination of the said threaded portion. The diaphragm 10 is formed with an opening designed to receive the threaded end of the plunger, and the edges of this

opening are clamped between the shoulder 18 and the end of a tubular sleeve 19 which is threaded upon the extremity of the plunger. This tubular sleeve slides freely within the pipe 6 extending downwardly from the plate 4 and coöperates therewith to direct the plunger in its vertical movements. It will also be observed that the tubular sleeve 19 is formed in its sides with a series of longitudinal slots 19ª through which the dust and air can enter the sleeve and pass into the tubular plunger from under the diaphragm.

The lower portions of each opposite pair of the legs are connected by an upper track 20ª and a lower track 20ᵇ, and a carriage which carries the nozzle is mounted upon these tracks so as to move freely back and forth thereon. As shown on the drawing, this carriage comprises a pair of axles 21 each of which has a small wheel 26 and a large wheel 27 mounted upon each end thereof, the smaller wheels 26 of the two axles traveling upon the lower tracks 20ᵇ while the larger wheels 27 travel upon the upper tracks 20ª. The two axles 21 are joined by two longitudinal spring strips 21ª and these two spring strips are connected by the transverse bar 21ᵇ to which the nozzle 9 is rigidly connected. As the carriage is moved upon the track the nozzle is drawn back and forth across the floor and held in a yielding engagement therewith by means of the spring bars 21ª. A bell crank lever 22 is pivotally mounted upon the cross piece 2ª, one of the arms of the bell crank lever having a sliding connection with the carriage, while the opposite arm of the bell crank lever is connected by a link 23 to one of the hand levers 12.

When the handles 17 at the outer end of the hand levers 12 are moved upwardly by the operator, the entire device is lifted from the floor so as to be readily shifted to a new position thereon. At the same time, the tubular plunger 11 is forced downwardly and the air and dust which were previously sucked into the cylinder under the diaphragm 10 forced through the slotted sleeve 19, the tubular plunger 11, and the spouts 15, into the cylinder, the check valve 7 being closed while the check valve 14 is open. The air which is thus forced into the cylinder 3 passes freely through the fabric 5, while the dust is prevented from escape by the said fabric and collected within the cylinder upon the plate 24. When the device is placed in a new position upon the floor, the handles 17 are moved downwardly, and the diaphragm 10 drawn upwardly by the tubular plunger 11. The valve 7 is opened and the valve 14 closed so that suction is produced and air drawn into the nozzle 9 through the slot 9ª therein. The nozzle is at the same time moved across the floor by means of the bell crank lever 22. It will thus be obvious that the nozzle is peculiarly mounted so as to be automatically moved back and forth across the floor when the suction device is operated, and that the dust which is drawn through the nozzle is collected within the cylinder 3. Attention is also directed to the fact that the fabric 5 is continually vibrated up and down when the levers are operated so that dust is prevented from accumulating thereon and clogging the machine. When it is desired to remove the dust from the cylinder, it is merely necessary to slip the ring 25 by means of which the edges of the fabric are secured thereto, from the end of the cylinder. As shown on the drawings, this ring has the cross section of an angle bar and is shown as formed with annular flanges projecting at right angles to each other, one of the flanges being designed to fit over the end of the cylinder, while the opposite flange engages the fabric.

Having thus described the invention, what is claimed as new is:

1. The combination of a frame, a nozzle movably mounted upon the frame, a suction device for drawing air through the nozzle, a lever for operating the suction device, and an operative connection between the lever and the nozzle for automatically moving the nozzle when the suction device is operated.

2. The combination of a frame, a track upon the frame, a carriage mounted upon the track and formed with a spring member, a nozzle applied to the spring member, means for drawing air through the nozzle, and means for moving the carriage upon the track.

3. The combination of a frame, a pair of upper tracks upon the frame, a pair of lower tracks upon the frame, a carriage formed with two sets of wheels one of which is designed to travel upon the upper tracks while the other is designed to travel upon the lower tracks, a nozzle upon the carriage, means for drawing air through the nozzle, and means for moving the carriage upon the tracks.

In testimony whereof I affix my signature in presence of two witnesses.

GERHARD L. BUSIAN. [L. S.]

Witnesses:
N. A. COLEMAN,
F. E. CHICKERING.