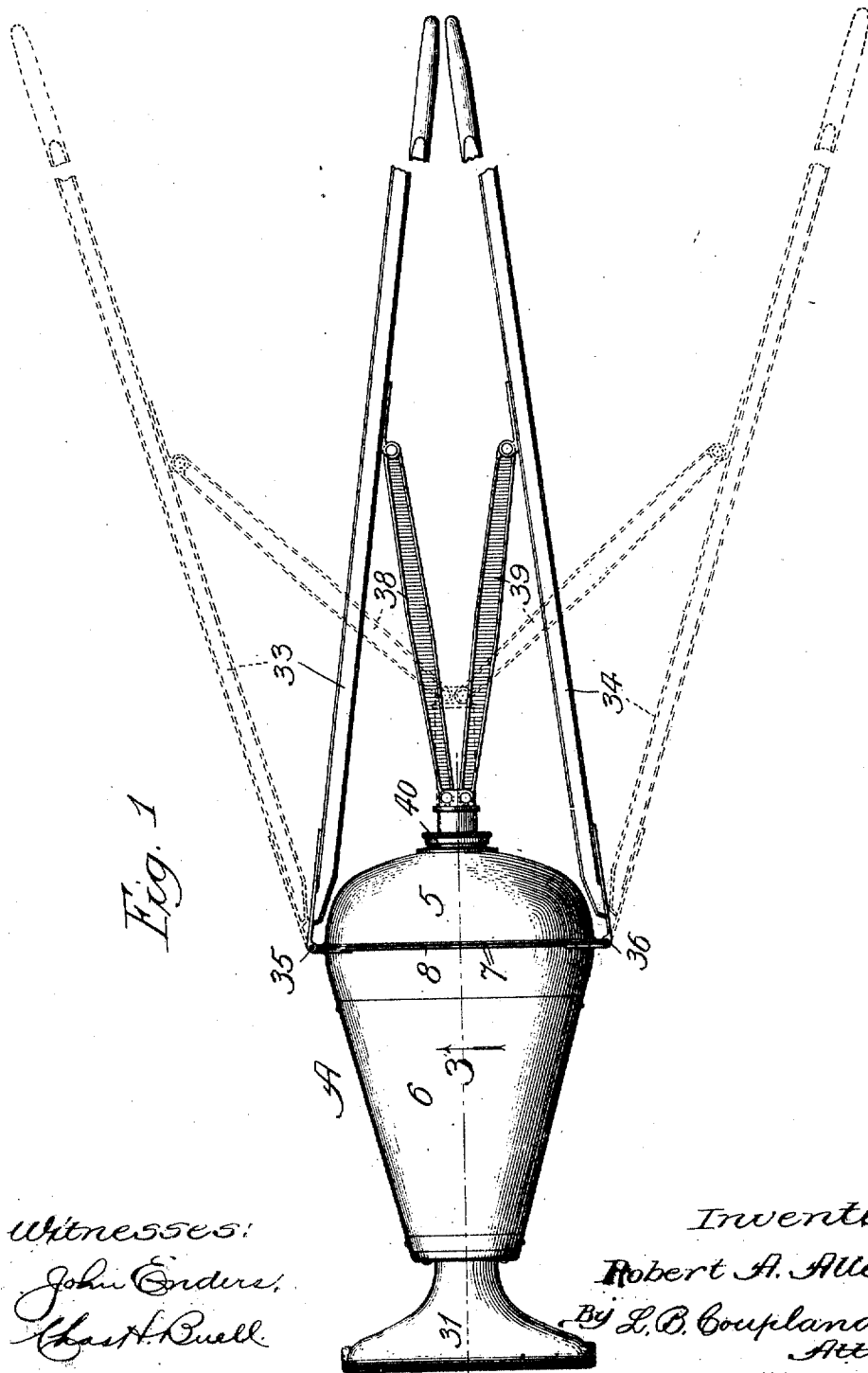


R. A. ALLEN.
DUST COLLECTING APPARATUS.
APPLICATION FILED AUG. 6, 1908.

Patented Mar. 7, 1911.

2 SHEETS—SHEET 1.

985,765.

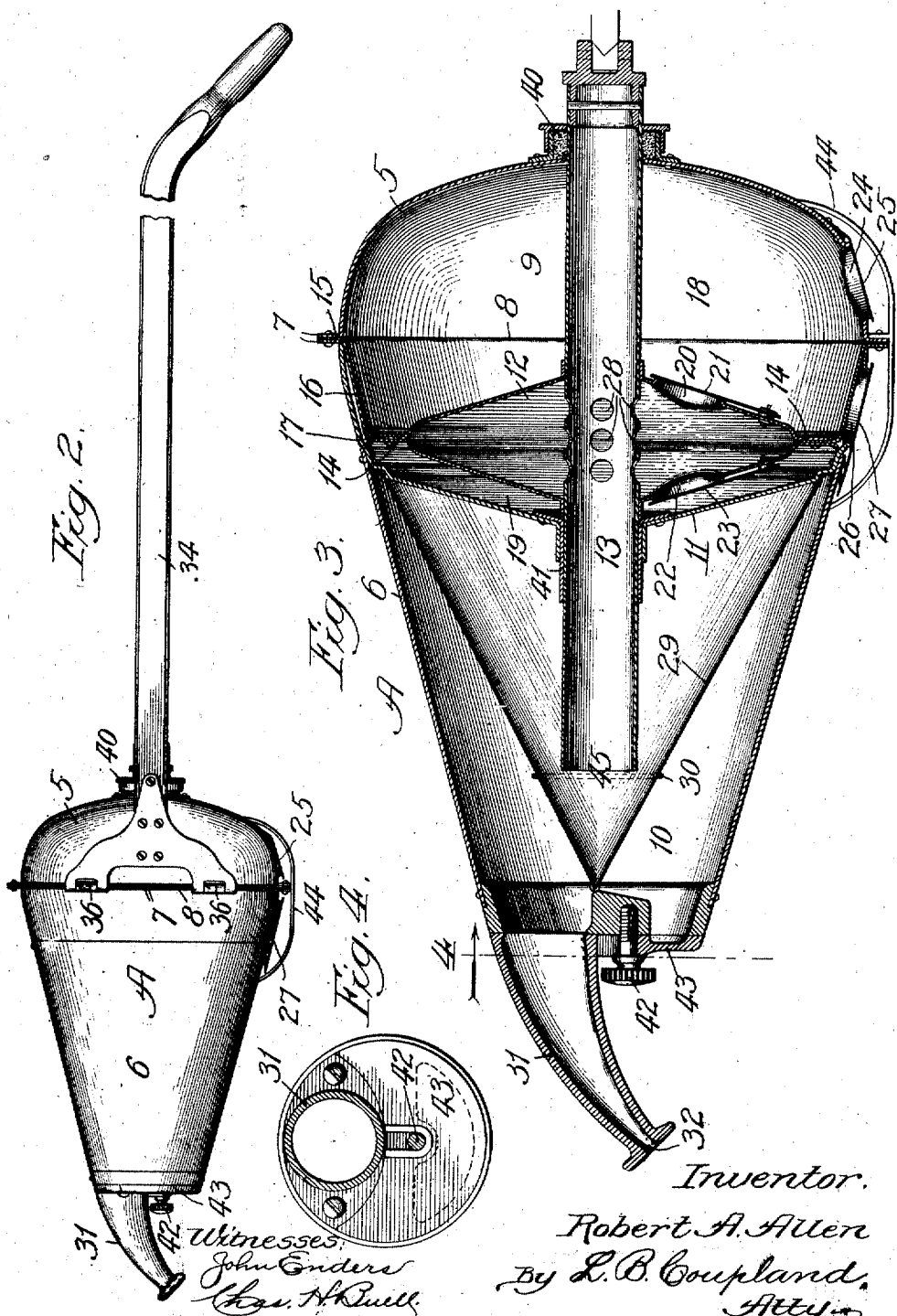


985,765.

R. A. ALLEN.
DUST COLLECTING APPARATUS.
APPLICATION FILED AUG. 6, 1908.

Patented Mar. 7, 1911.

2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

ROBERT A. ALLEN, OF CHICAGO, ILLINOIS.

DUST-COLLECTING APPARATUS.

985,765.

Specification of Letters Patent.

Patented Mar. 7, 1911.

Application filed August 6, 1908. Serial No. 447,237.

To all whom it may concern:

Be it known that I, ROBERT A. ALLEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Dust-Collecting Apparatus, of which the following is a specification.

This invention relates to a portable dust and dirt collecting apparatus of the type used in cleaning carpets, rugs, draperies and similar household furnishings; and has for its object to provide a device of this character that possesses great efficiency, is easy of manipulation and can be manufactured at a cost that will permit of general use.

The machine is operated by hand and is of the double acting type with a continuous suction as it is propelled back and forth over the surface or object being cleaned.

Figure 1 is a front elevation. Fig. 2 is a side elevation. Fig. 3 is a vertical longitudinal section on line 3, Fig. 1. Fig. 4 is a horizontal section on line 4, Fig. 3.

A represents an inclosing casing comprising the upper part 5 and the lower part 6 provided with flanged edges 7 and joined together on line 8. Interiorly the casing is divided into two compartments, the air-chamber 9 and the dust-chamber 10, by a rigid diaphragm 11. A hollow piston 12 is located in the air-chamber and is rigidly mounted on a tubular piston-rod 13, the lower part of which extends some distance therethrough, as shown in Fig. 3. The hollow piston has a reciprocating movement and will ordinarily be made in two parts which are provided with the joining flanged edges 14. The piston is free from any contacting walls and is entirely surrounded by space. This provides for a free and easy movement of the same and yet keeps the dimensions of the air-chamber within practical limits for a proper working of all the parts and excessive pressure avoided. The upper edge 15 of a flexible hinge diaphragm 16 is secured in place by being tightly clamped between the joining flanged edges 7 of the two part casing. The inner or lower edge 17 of this flexible diaphragm is clamped between the flanged edges 14 of this piston 12. This diaphragm follows the movement of the piston and serves the purpose of dividing the air-chamber into two sub-compartments, the upper and lower compartments 18 and 19 respectively. By this

arrangement a continuous suction or double action is secured.

The piston is provided in the upper side with an air outlet port 20 covered by a check-valve 21, in the under or opposite side with an outlet port 22 provided with a companion valve 23. These valves have an alternate automatic opening and closing action in allowing the air to escape at the proper time coincident with the direction in which the piston is traveling.

An air-exhaust port 24 is located in the upper division part 18 of the casing and is covered by an exhaust valve 25 opening outward. A companion exhaust port 26 is located in the lower division part 19 of the casing and the passage therethrough controlled by a valve 27.

The tubular piston-rod is open at the inner or lower end and is provided in that portion thereof inside of the piston with a number of apertures 28 opening thereinto as shown in Fig. 3.

A hollow cone shaped screen-body 29 is located in the dust-chamber 10 and serves the purpose of separating the air and dust entering through the suction intake; the dust and dirt being stopped in the dust-chamber and the air filtered through the screen walls located in the passage leading to the outer atmosphere. The screen-body is preferably of the conical form shown, as it provides a large area of filtering surface within a compact space and at the same time leaves sufficient room for a considerable deposit of refuse matter. This screening surface may be composed of wire cloth or any textile fabric suitable for the purpose. The ring or collar 30 is a reinforce to stiffen and strengthen the tapering end of the screen-body.

The suction-nozzle 31 is rigidly secured to the casing and is provided with the air and dust inlet-slot 32. By having a rigid attachment for the suction-nozzle without the interposition of a flexible connection, prevents the liability of choking up or lessening the area of the intake passage and allows the whole weight of the machine to rest on the surface being cleaned and thereby secures the best possible results. The nozzle is curved so that when the suction or foot end of the same is flat on the surface the apparatus will be inclined at about the proper angle for easy manipulation.

The inner ends of the manipulating han-

dles 33 and 34 are connected to the casing by companion hinges 35 and 36 which are located on opposite sides and provides for the pivotal action necessary in imparting a lateral in and out movement to the handles which are shown in their innermost position, the dotted lines indicating the opposite position. The handles and outer end of the tubular piston-rod are pivotally connected by toggle links 38 and 39, so positioned as to insure a straight pull and push on the rod which works through the two stuffing boxes 40 and 41. This form of connection holds the handles equidistant from a center line and reduces the working friction to a minimum.

The lateral or in and out movement of the operating handles has a natural cooperative action in propelling the machine over the surface being cleaned. That is, the motion and power expended in operating the machine through the movement of the handles also greatly assists in the back and forth movement of the machine and thereby greatly lessens the labor.

The refuse contents of the dust compartment may be conveniently removed from time to time by slacking up on a screw 42 and slipping out a plate 43 removably held in place thereby. A guard-cap 44 serves the purpose of protecting the exhaust valves from injury.

In practical working the operation is as follows: The position of the handles in Fig. 1 and the position of the piston in Fig. 3 correspond, which is the normal or rest position of the different parts. The outward movement of the handles imparts an outward or up movement to the piston-rod and the piston carried thereby which creates a strong suction and draws in the air and dust through the suction-nozzle with great force, the air separating from the dirt particles passes through the screening surface into the open end 45 of the piston-rod and escapes into the hollow piston through apertures 28. On the up movement of the piston a partial vacuum is formed in the sub-

air-chamber 19 which together with the air pressure from the inside of the piston opens the valve 23 and the air escapes into chamber 19 the area of which increases with the upward travel of the piston. At the same time the upward movement of the piston will force open the exhaust valve 25 and the air displaced in chamber 18 will be discharged therethrough into the atmosphere. On the down stroke of the piston this operation is reversed, the valve 21, opening for the escape of air from the piston and the exhaust-valve 27 opening outward for the discharge of the volume of air, and so on alternately in maintaining a continuous operation.

Having thus described my invention what I claim is—

1. In a device of the character described, the combination with a dome shaped casing, an air chamber therein into which air passes from the atmosphere, a chamber above said air chamber, a hollow piston, a flexible diaphragm extending from the piston to the walls of the casing and subdividing the last named chamber, an exhaust valve in the wall of the chamber upon each side of the diaphragm, a tubular piston rod having ports formed therein that open into the hollow piston, and check valves opening outwardly from the opposite sides of said piston.

2. In an apparatus of the class described, a casing, a dust-chamber, an air-chamber into which the incoming air passes from the dust-chamber, a hollow piston, a tubular piston-rod having apertures therein which open into said piston, the valves opening outward from opposite sides thereof and means for dividing said air-chamber into sub-compartments.

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

ROBERT A. ALLEN.

Witnesses:

M. D. STANWOOD,
G. E. CHURCH.