E. C. STAFFORD.

CLEANING APPARATUS.

APPLICATION FILED MAR. 6, 1909.

1,036,365.

Patented Aug. 20, 1912.

2 SHEETS—SHEET 1.

FIG. 1.

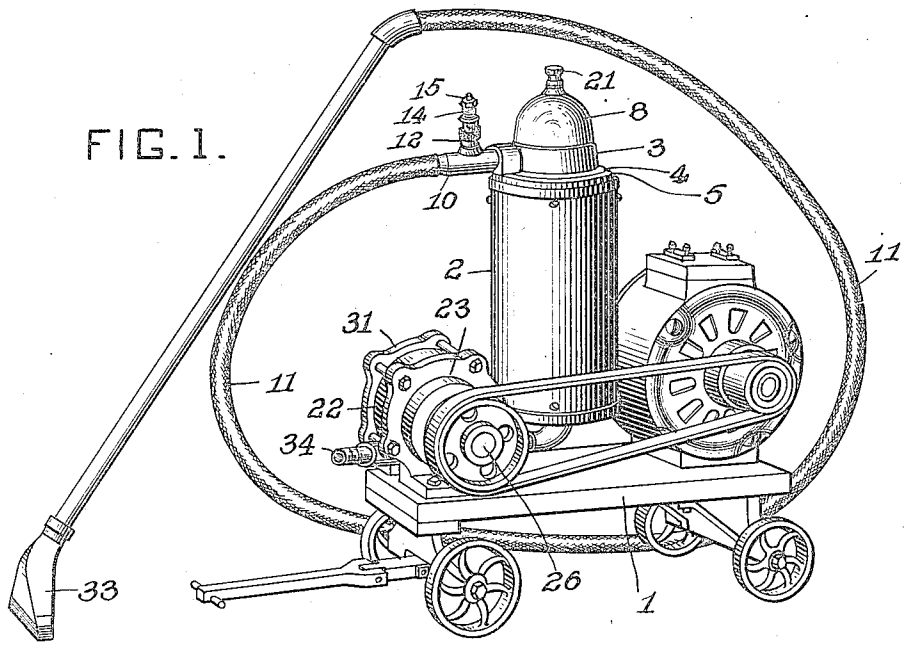
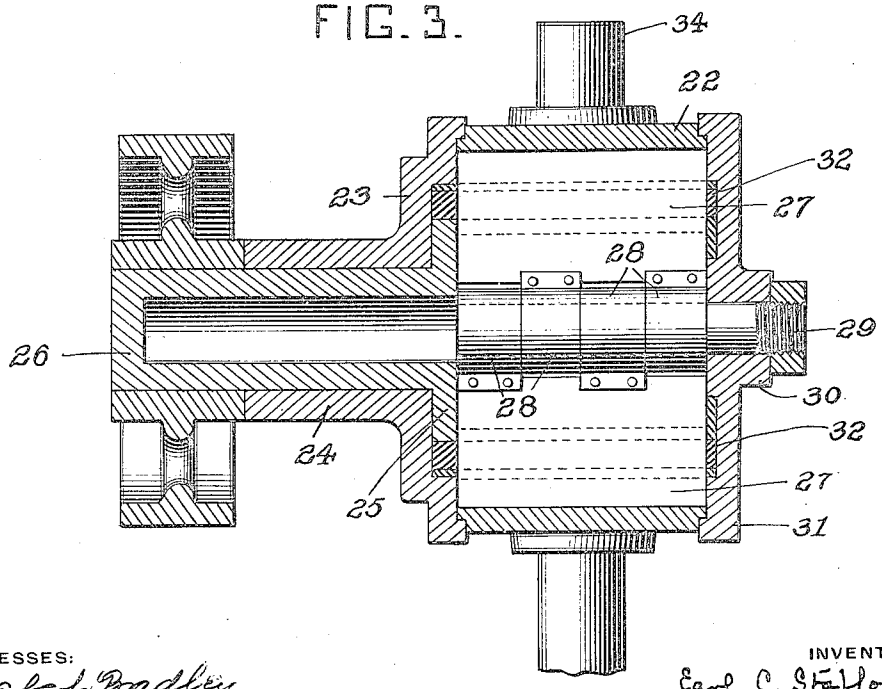


FIG. 3.



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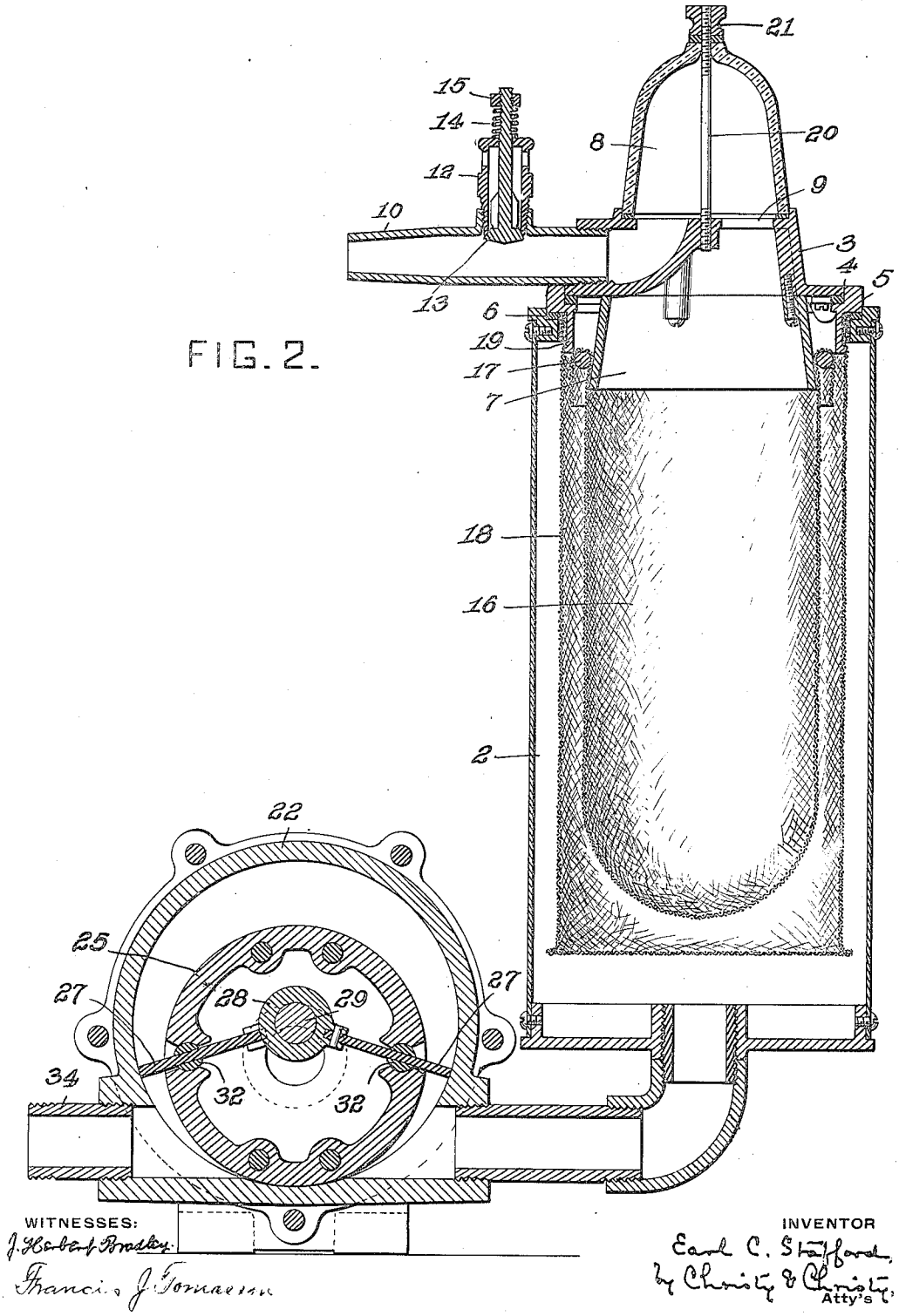
2 SHEETS—SHEET 2.

FIG. 2.



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UNITED STATES PATENT OFFICE.

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CLEANING APPARATUS.

1,036,365. Specification of Letters Patent. Patented Aug. 20, 1912.

Application filed March 6, 1909. Serial No. 481,628.

To all whom it may concern:

Be it known that I, EARL C. STAFFORD, residing at Wilkinsburg, in the county of Allegheny and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Cleaning Apparatus, of which improvements the following is a specification.

The invention described herein relates to certain improvements in apparatus for cleaning floors, carpets, etc., and has for its object a construction and combination of parts or elements whereby the apparatus may be employed to clean carpets, etc., the dirt being drawn up through and from the carpet, or as a blowing apparatus.

It is a further object of this invention to provide a receptacle permeable only by air for the collection of dirt and dust, such receptacle being capable of being removed with the contained dirt, etc., and another substituted therefor.

The invention is hereinafter more fully described and claimed.

In the accompanying drawing forming a part of this specification, Figure 1 is a perspective view of my improved apparatus. Fig. 2 is a sectional elevation of the vacuum chamber and exhaust pump on an enlarged scale and Fig. 3 is a sectional plan view of the exhaust pump.

In the practice of my invention the parts of the apparatus, consisting of an air pump and vacuum chamber, are preferably mounted on a truck 1 for convenience of moving the apparatus. The vacuum chamber 2 is connected to the inlet of the air pump, which is preferably of the rotary type, so that there will be a steady pull of air through the chamber 2. The head or cover 3 of the chamber has an air tight seat, preferably countersunk, as at 4, in a ring 5 which is seated on a packing ring 6 in a groove in the upper end of vacuum chamber 2, as shown in Fig. 2.

The head or cover is provided on its under side with an annular flange 7 projecting down into the vacuum chamber, and on its upper side with an inlet chamber 8, which is connected to the vacuum chamber by a port or opening 9 within the flange 7. The head or cover is provided with a nozzle 10 communicating with the inlet chamber and adapted to be connected to a flexible pipe 11 when cleaning. In order to regulate the vacuum, a normally closed inlet valve is provided to admit air at some point between, the cleaning head and the exhaust apparatus. This valve is preferably adjacent to the inlet chamber 8 as for example in the nozzle 10, and consists of a shell 12 screwing into an opening in the nozzle and a valve 13 arranged to close in the inner end of the shell. The valve is held closed by a spring 14 surrounding the stem of the valve and interposed between the end of the shell and a nut 15 screwing onto the stem.

The valve mechanism is so constructed that it is held closed by the spring 14 acting against atmospheric pressure on the valve, so that by adjusting the tension of the spring any desired vacuum may be obtained without varying the speed of the pump, and by pressing on the stem of the valve, the vacuum can be entirely destroyed or reduced to a minimum.

A dirt receptacle 16 permeable to air, but impermeable to dust or dirt is arranged in such manner within the chamber that the air drawn in through the nozzle must pass through the receptacle on its way to the pump, so that any dust or dirt entering with the air, will be retained by the receptacle and the receptacle held in operative or receptive condition by the inflow of air. This receptacle is preferably formed of a suitable fabric in the form of a bag and is detachably secured by a spring ring 17 to the annular flange 7. This construction permits of the easy removal of the receptacle, the cover being held in position by atmospheric pressure. Experience has shown that very fine particles of dust will pass through a single thickness of material sufficiently porous to permit of the passage of air. It has been attempted to overcome this escape by employing two thicknesses of material in forming the receptacle, but it has been found that such a receptacle becomes clogged, and is very difficult to clean, the dust lodging between the two layers of cloth. By arranging the receiving receptacle 16 within a second receptacle 18 formed of material permeable to air, the walls of the receptacles being separated or out of contact, so that the retardation of the air caused in passing through the walls of the inner receptacle may be overcome to some extent in the space between the two receptacles. As above stated when two receptacles formed

of permeable material are arranged in contact one with another they form practically a single wall receptacle of less permeability than either one of the two. On the other hand if the receptacles be separated such a distance that the air and particles carried through the first, can acquire a considerable velocity, it is found that some of the dust, etc., will be carried through the first and also through the second, due to the velocity acquired between the two receptacles. This outer receptacle may be supported in any suitable manner but is preferably secured to a flange 19 on the ring 5, supporting this cover. This construction permits of the easy removal of the outer receptacle for cleaning.

The inlet chamber 8 is preferably formed by a glass bell resting on a packing ring on the cover 3, and held in place by a rod 20 attached to the cover and passing up through the bell, and a nut 21 screwing onto the rod. By making the walls of the inlet transparent the operation of the apparatus can be watched, and the necessity of any change immediately determined.

It has heretofore been the practice to employ a centrifugal fan in carpet cleaning apparatus, thus necessitating a high speed of rotation of the fan to obtain a sufficient vacuum to remove any dirt and with the most efficient fan a vacuum sufficient to draw the dirt under the carpet through the latter could not be obtained within reasonable limits of operating expenses. In lieu of such fan I employ a positively operating rotary pump and can obtain any required vacuum by small changes in speed of the pump. This pump consists of a shell or cylinder 22 having one head as 23, provided with a tubular bearing 24 eccentrically arranged, as shown in Fig. 3. A blade operating drum 25 is arranged within the cylinder and has its journal 26 mounted in the bearing 24. The drum is made of such a diameter that when its journal is mounted in the bearing 24, the outer periphery of the drum will be nearly in contact with the inner periphery of the cylinder for a short peripheral distance. The blades 27 are provided at their inner ends with sleeves 28 for the reception of the supporting spindle 29, which has its outer end supported in the concentric bearing 30 on the head 31 of the cylinder. These blades extend through slots in the periphery of the drum by which they are carried around inside the cylinder, their outer edges being in contact with the inner periphery of the cylinder. To reduce wear caused by the rocking and sliding movements of the blades relative to the drum slotted cylindrical blocks 32 are mounted in the slots in the drum, the blade passing through the slots in the blocks.

The pump may be operated by any suitable motor preferably an electric motor constructed to be operated by the usual incandescent light current. In cleaning carpets the flexible pipe having a suitable exhaust head 33 is connected to the nozzle 11, but when the apparatus is to be used for blowing, a flexible pipe is attached to the outlet pipe 34 of the pump.

I claim herein as my invention:

1. In a cleaning machine, the combination of a chamber provided with inlet and outlet ports or openings, depending receptacles having permeable walls arranged in the chamber, one within but separated from the other, the receptacles being so arranged that the inlet port will discharge into the inner receptacle, and means for maintaining a practically uniform flow of air through the chamber and receptacles.

2. In a cleaning machine, the combination of a chamber provided with inlet and outlet ports or openings, depending receptacles having permeable walls arranged in the chamber, one within but separated from the other, the receptacles being so arranged that the inlet port will discharge into the inner receptacle, said outer receptacle being adapted to be maintained separated from said inner receptacle by the flow of air through said ports.

In testimony whereof, I have hereunto set my hand.

EARL C. STAFFORD.

Witnesses:
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