

1,035,515.

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UNITED STATES PATENT OFFICE.

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HYDRAULIC VACUUM-PRODUCER AND AIR-COMPRESSOR.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, MARTIN ARMSTRONG, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Hydraulic Vacuum-Producers and Air-Compressors, of which the following is a specification.

This invention relates to apparatus whereby a vacuum may be created or air compressed, the special object being to produce a device which utilizes the water, under pressure, from a house faucet for cleaning purposes, that is for withdrawing dust and lint from carpets, furniture or other house furnishings.

A further object is to produce a device for mixing the dust and other foreign particles gathered up by the device, with the water used for operating it and to discharge such contaminated water into a sink or other waste receptacle.

A still further object is to produce a device of the character outlined which operates efficiently and reliably is small and compact, light in weight for convenience of portability, and of simple, strong, durable and inexpensive construction.

To these ends the invention consists in certain novel and peculiar features of construction and organization, as hereinafter described and claimed; and in order that it may be fully understood reference is to be had to the accompanying drawings, in which—

Figure 1, is a central vertical section through the device on the line I—I of Fig. 3. Fig. 2, is an inverted plan view of the cap of the device. Fig. 3, is a section on the line III—III of Fig. 2. Fig. 4, is a horizontal section on the line IV—IV of Fig. 1. Fig. 5, is a section on the line V—V of Fig. 1.

In the said drawings, 1 indicates a suitable frame, preferably of skeleton form and provided with a cross bar 2, equipped centrally with a ball-bearing 3, and above said bearing the frame is provided with a horizontal table 4 having a central bore or passage, in line with the ball-bearing and surrounded by an upwardly-projecting conical flange 5, arranged concentrically with respect to the circular collar 6, in which the upper end of the frame terminates; said collar being internally reduced at its lower

end to provide a circular shoulder or ledge 7 underlying a cylinder 8, fitting in the collar and secured rigidly to the frame in any suitable manner.

9 indicates a vertical shaft arranged centrally in and projecting from a point slightly above the top of the cylinder through the ball-bearing, and reduced at its lower end to provide a downwardly-disposed shoulder 10 imposing downward endwise thrust on said bearing, and rigidly secured on the shaft between the ball-bearing and table 4, and preferably of the same diameter as said table is a fly-wheel 11, water running down said shaft or dropping down upon the table, being prevented from passing through the latter onto the fly-wheel by means of a conical water-shed or deflector 12 secured on the shaft and overhanging flange 5.

13 is a cap rigid with the cylinder and provided with a central recess 14 receiving the upper end of the shaft, and a surrounding recess 15 receiving the upper end of the cylinder, and to reduce friction between the cap and shaft, the former is provided with a conical-end bearing-screw 16 engaging the upper end of the shaft.

17 and 18 are ports or passages through the cap, at diametrically-opposite sides, by preference, of its center, the port 18 extending obliquely, by preference, and communicating with the upper end of said port is a pipe 19 adapted to be connected in any suitable manner to a faucet, preferably through the medium of a section 20 of flexible hose.

21 is a short metal tube secured to the cap and communicating with port 17, which at its lower end communicates with an arcuate chamber or recess 22, terminating at opposite sides of port 18, and 23 is a section of flexible hose connecting pipe 21 with the pick-up or gathering device.

24 is a wheel rigidly secured on shaft 9 and fitting snugly in and corresponding in length to cylinder 8 and preferably equipped with a packing ring 25, to form a substantially water-tight joint with the cylinder. The wheel fits snugly against the base of recess 15 and is provided with a plurality of passages 26, arranged circularly and adapted to successively register with and receive water from port 18, the water entering passages 26, from said port at an angle in order that the force or impact of

the water on the sides of the passages shall impart rapid rotation to the wheel. To utilize the water a second time in the propulsion of the wheel and hence increase the speed of the latter, its passages 26 are provided with oblique or angular extensions 27 upon which such water impinges and thus tends to rotate the wheel. It will thus be seen that the same water acts twice on the wheel to rotate the same. In practice the wheel is turned with such rapidity that each passage 20 is only partially filled with water by the time it passes out of communication with port 18 and into communication with chamber 22, from which chamber through the medium of port 17, it receives a charge of air in superposed relation to the charge of water, and owing to the fact that it remains in communication with chamber 22 for the major portion of its revolution, it is practically filled with air by the time it completes such revolution and again passes into communication with port 18 to again receive water therefrom, which water compresses the air below it in such passage. If the speed of rotation is sufficient this second charge of water may not fill the passage and the latter may receive a second charge of air upon said second charge of water, the air escaping into the atmosphere or being retained in a tank (not shown) and the water containing the dust, lint, and other foreign matter passing through the drain of the sink to the sewer.

From the above description it will be apparent that I have produced apparatus of the character outlined which embodies the features of advantage enumerated as desirable and which is obviously susceptible of modification in form, proportion, detail construction and organization without departing from the essential spirit and scope of the appended claims.

Having thus described the invention what I claim as new and desire to secure by Letters-Patent, is:

1. An apparatus of the character described, comprising a hollow cylinder, a cap thereon having a water-supply port and an air-supply port, a wheel within the cylinder, provided with a passage extending from one face to the other; the water-supply port and the passage of the wheel bearing an angular relation, a fly-wheel rotatable with the first-named wheel, and a table interposed between the fly-wheel and the discharge end of the first-named wheel.

2. An apparatus of the character described, comprising a hollow cylinder, a cap thereon having a water-supply port and an air-supply port, a wheel within the cylinder, provided with a passage extending from one face to the other; the water-supply port and the passage of the wheel bearing an angular relation, a fly-wheel rotatable with the

first-named wheel, a table interposed between said wheels and provided with an opening through which shaft extends and a water-shed mounted on the shaft and interposed between said table and the first-named wheel to deflect water discharged by the latter outwardly against the table.

3. An apparatus of the character described, comprising a suitable frame, a ball-bearing carried thereby; a shaft having a reduced lower end journaled in and bearing on the ball-bearing, a fly-wheel secured on the shaft, a table rigid with the frame above the fly-wheel and provided with an opening through which the shaft extends, a water-shed rigid with the shaft and overhanging said opening, a cylinder carried by the frame above the water-shed, a wheel rigidly secured to the shaft and fitting snugly in the cylinder and provided with a passage extending from its upper to its lower face, and a cap surmounting the cylinder and provided with a water-supply port bearing an angular relation to the passages of said wheel and an air-supply port with which the passages of the wheel are adapted to successively communicate.

4. An apparatus of the character described, comprising a wheel provided with a passage extending from one face to the other, a cap over one face of the wheel, provided with a pair of ports with which the passage of the wheel when rotating successively registers and with an arcuate recess communicating with one of the ports to increase the length of time which said port communicates with the passage of the wheel in each revolution of the latter.

5. An apparatus of the character described, comprising a hollow cylinder, a wheel rotatable therein and provided with a series of passages extending from one face of the wheel to the other, all of the passages at one end being an equal distance from the axis of the wheel, and a cap fitting over one end of the cylinder and provided with a recess receiving the last-named end of the wheel, a recess curved concentrically of the axis of the wheel and communicating simultaneously with most of the passages of the wheel, and a pair of ports both communicating with the first-named recess and one with the said curved recess also.

6. An apparatus of the character described, comprising a hollow cylinder, a wheel rotatable therein and provided with a series of passages extending from one face of the wheel to the other, all of the passages at one end being an equal distance from the axis of the wheel, a cap fitting over one end of the cylinder and provided with a recess receiving the last-named end of the wheel, a recess curved concentrically of the axis of the wheel and communicating simultaneously with most of the passages of the

5 wheel, and a pair of ports both communicating with the first-named recess and one with the said curved recess also, a shaft rigidly carrying the wheel, and a screw mounted in the said cap and constituting a bearing for the adjacent end of the shaft.

10 7. In an elastic fluid compressor employing a head of liquid discharged in a stream, as a compressing agent, a member to deliver said stream, a series of substantially straight compression tubes arranged to form a cage or drum and having mouths arranged to

pass across the stream and slice off slugs of liquid therefrom to act as pistons in said tubes, the tubes extending at an angle to the direction of the stream, to enable the impact of the liquid against the sides of the tubes to rotate the cage or drum. 15

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

MARTIN ARMSTRONG.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
