

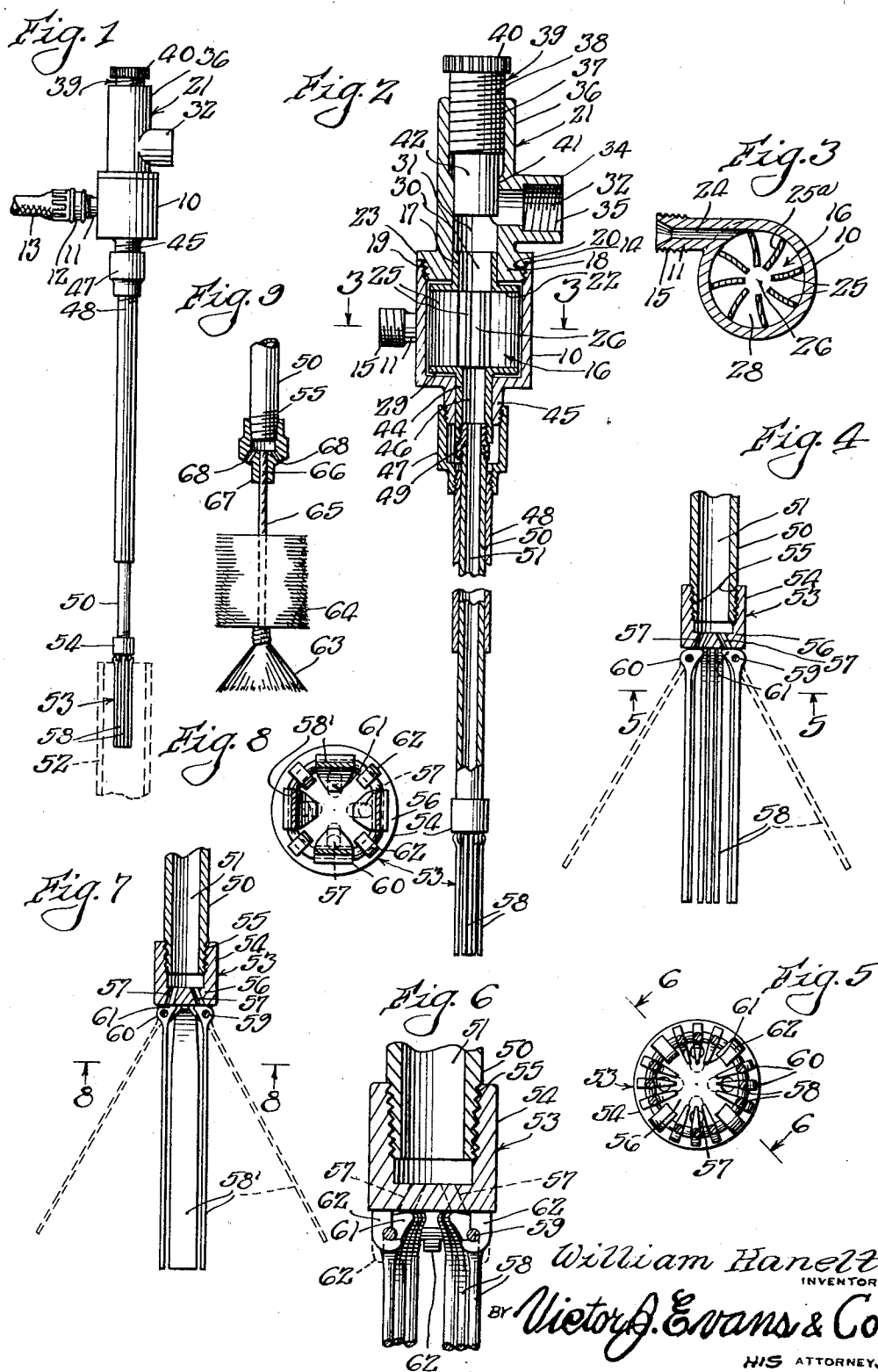
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ROTARY BRUSH

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ROTARY BRUSH

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This invention relates to certain novel improvements in rotary brushes, and has for its principal object the provision of an improved construction of this character which will be highly efficient in use and economical in manufacture.

This application is a continuation in part of my United States Patent No. 1,837,904, filed August 11, 1930.

It is an object of this invention to provide an improved rotary brush adapted for many uses, such as, for example, the scouring or cleaning of flues, pipes, or other things into which the brush may be inserted and revolved.

Another object of the invention is to provide an improved and novel combination of a fluid current operated turbine and a rotary brush structure operated thereby which will simultaneously scour and clean a surface within which the brush is rotated.

A further object of the invention resides in the provision of novel and improved means for readily attaching the brush to and detaching the same from the rotary element of a turbine embodied in the invention in such a manner that the fluid current which operates the turbine will be fed between the scouring elements of the brush as the latter is revolved and the scouring elements are spread apart by centrifugal force.

An additional object is the provision of novel and improved means for regulating the flow of the fluid current.

A still further object of the invention is to provide novel and improved means for readily attaching the turbine and brush to a source of fluid under pressure.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangements of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawing showing the preferred form of construction, and in which:

Fig. 1 is a side elevational view of a preferred form of construction of the invention;

Fig. 2 is a longitudinal sectional view of the invention;

Fig. 3 is a sectional view on line 3—3 in Fig. 2;

Fig. 4 is a detail view, partly in section, of the brush structure;

Fig. 5 is a plan view, partly in section, on line 5—5 in Fig. 4;

Fig. 6 is a sectional view on line 6—6 in Fig. 5;

Fig. 7 is a view similar to Fig. 4, showing a slightly modified form of construction of the brush structure;

Fig. 8 is a plan view, partly in section, on line 8—8 in Fig. 7; and

Fig. 9 is a view similar to Figure 4, showing another modified form of construction of the brush structure.

Referring to the drawing, which illustrates practical and preferred embodiments of the invention, and referring more particularly to Figs. 1 to 6 inclusive, indicated at 10 is a fluid current operated turbine housing in which is provided a fluid inlet 11 which is externally threaded, as at 15, to receive the connecting ring 12 of a hose 13 which may be attached to a suitable source of fluid under pressure, such as, for example, a water faucet.

Rotatably mounted in the main chamber of the housing 10 is a rotor 16 which includes a trunnion 17 that is provided in a portion 18 of a housing 21. The portion 18 of the housing 21 is externally threaded, as at 19, into the internal threads 20 of the housing 10. To limit the penetration of the portion 18 into the housing 10 an external flange 23 is provided in the portion 18, and this flange 23 fits over the end 14 of the housing 10.

A passage 24 is provided through the inlet 11 and this passage opens into the housing 10 in such a manner that a fluid entering the housing 10 is directed against the outer ends of the vanes 25 of the turbine rotor 16. The vanes 25 are arranged radially about a central passage 26 of the rotor, into which passage the radial spaces 28 between the vanes 25 open (Fig. 3). The vanes 25 are secured, in any approved manner, to the end walls 22 and 29 of the rotor 16.

The central passage 26 communicates

with a bore 30 in the trunnion 17, and this bore 30 is adapted to communicate with a passage 31 in the housing 21. The passage 31 communicates with an outlet passage 32 which is provided in a boss 34 on the housing 21. The outlet passage 32 is internally threaded, as at 35, to receive a suitable conduit (not shown).

The housing 21 includes a portion 36 in which is provided a threaded bore 37 which receives an externally threaded portion 38 of a valve 39 on which is a knurled flange 40 providing a finger grip. The inner end of the bore 37 is defined by an internal shoulder 41 through which is adapted to penetrate the stem 42 of the valve 39. The valve stem 42, therefore, controls the flow of the fluid out of the outlet 32, and by manipulating the valve 39 the flow through the outlet may be varied or completely shut off as desired.

The rotor 16 includes a trunnion 44 which is disposed in a bored boss 45 on the housing 10, and this trunnion 44 is provided with a passage 46 which will be termed, hereinafter, as a by-pass. The boss 45 is externally threaded to an internally threaded portion of a sleeve 47, and the other end portion of the sleeve 47 is reduced and internally threaded to receive the externally threaded end portion of a jacket 48.

The outer end of the trunnion 44 is threaded internally to receive an externally threaded portion of a bushing 49, the outer end and internally threaded end portion of which receives an external threaded portion of a tubular member or hollow shaft 50 in which is provided a passage 51. As shown, the jacket 48 surrounds a portion of the shaft 50.

The water or other fluid entering the inlet passage 24 flows against the faces 25a of the vanes 25, thereby to rotate the rotor 16 clockwise, as seen in Fig. 3. By regulating the valve 39 any desired fraction or all of the inflowing fluid may be directed from the central passage 26 through passage 46, into the passage 51 in the shaft 50, and since the shaft 50 is attached to the rotor 16 by bushing 19 the shaft 50 will rotate. By completely closing the valve 39 all of the fluid will be directed from the passage 16 to the shaft 50. The invention thus far described is claimed in my above identified patent, and is capable of uses other than those now to be described, by way of preferred example of practical means for using my improved turbine.

My invention may be used, for example, to scour the inner surface of a flue, indicated at 52. For this purpose I provide my improved brush structure 53 which separated from and in combination with my improved turbine forms the subject-matter to be claimed hereinafter. My improved brush

structure 53 includes a cap or base 54 which is internally threaded to receive the externally threaded end portion 55 of the shaft 50. In the wall 56 of the cap 54 are radially arranged apertures 57 which direct the fluid from the shaft 50 between the movable scouring or cleaning elements 58 of the brush which are attached to the wall 56 in a manner now to be described.

Struck out from the wall 56 are radially arranged ears 62 (Fig. 5) which retain to the cap an annulus 59 on which are mounted for swinging movement the apertured heads 60 of the elements 58, each of these heads 60 including a projecting portion 61, for a reason to be explained hereinafter.

As the shaft 50 is rotated and the fluid flows through the passage 51 thereof, the elements 58 are rotated and urged by centrifugal force laterally with respect to the axis of rotation of the brush and shaft and are thus spread apart into the dotted line position of Fig. 4. The elements 58 thus swing on the annulus or ring 59, and their free ends will thus engage the inner surface of the flue 52. When the elements 58 are at rest, the portion 61 about the wall 56 of the cap 54 and the elements 58 are thus kept aligned, as shown, and are prevented from becoming enmeshed or tangled together.

The elements 58 may be made of any suitable material, such, for example, as metal, and when rotated will effectively scour and clean a surface against which they may be directed by centrifugal force. As the elements 58 revolve and perform their cleaning or scouring function, the fluid is directed from the shaft passage 51 through the apertures 57 and between the elements 58, thereby effecting a combined scouring and cleansing operation.

In Figs. 7 and 8 a modified form of construction of my improved brush structure is illustrated, and in this form of the invention parts similar to those hereinbefore described will be given the same reference numerals. In this form of the invention the elements 58' are similar in construction to the elements 58 but are flat (Fig 7). It is within the purview of my invention, however, to make these elements in any shape that may be found best suited to the particular use to which the invention may be put.

In the form of the invention shown in Fig. 9 I provide bristles 63 and 64 on a stem 65, and this stem 65 has one end portion 66 suitably secured in a cap 67 which is threaded onto the shaft 50. The cap 67 is provided with radially arranged ports 68 for the passage therethrough of the fluid from the shaft 50, and these ports direct the fluid from the shaft 50 about the bristles 63 and 64 as the brush is revolved with the

shaft 50 by the rotor. This brush structure of Fig. 9 may be used, for example, as a bottle or container washer, the bristles 64 being adapted to be disposed within and engage the inside of the wall of the container while the bristles 63 may be used to clean the bottom of the container or bottle.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A device of the character described, comprising a fluid pressure operated turbine including a rotor provided with a fluid outlet, a tubular fluid-conducting member attached to said rotor, said tubular member having a fluid inlet communicating with said outlet, and said tubular member being provided with a fluid outlet, a cap member for detachable connection to said tubular member at the last-named outlet, said cap member being provided with apertures for communication with the tubular member, and cleaning elements swingingly mounted on said cap member.

2. A device of the character described, comprising a fluid pressure operated turbine including a rotor provided with a fluid outlet, a tubular fluid-conducting member attached to said rotor, said tubular member having a fluid inlet communicating with said outlet, and said tubular member being provided with a fluid outlet, a cap member for detachable connection to said tubular member at the last-named outlet, said cap member being provided with apertures for communication with the tubular member, cleaning elements swingingly mounted on said cap member, and means for directing the rotor operating fluid from the rotor selectively to either the first or second-named outlet.

3. A device of the character described, comprising a fluid pressure operated turbine including a rotor provided with a fluid outlet, a tubular fluid-conducting member attached to said rotor, said tubular member having a fluid inlet communicating with said outlet, and said tubular member being provided with a fluid outlet, a cap member attached to said tubular member at the last-named outlet, said cap member being provided with apertures for communication with the tubular member, and cleaning elements swingingly mounted on said cap member.

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