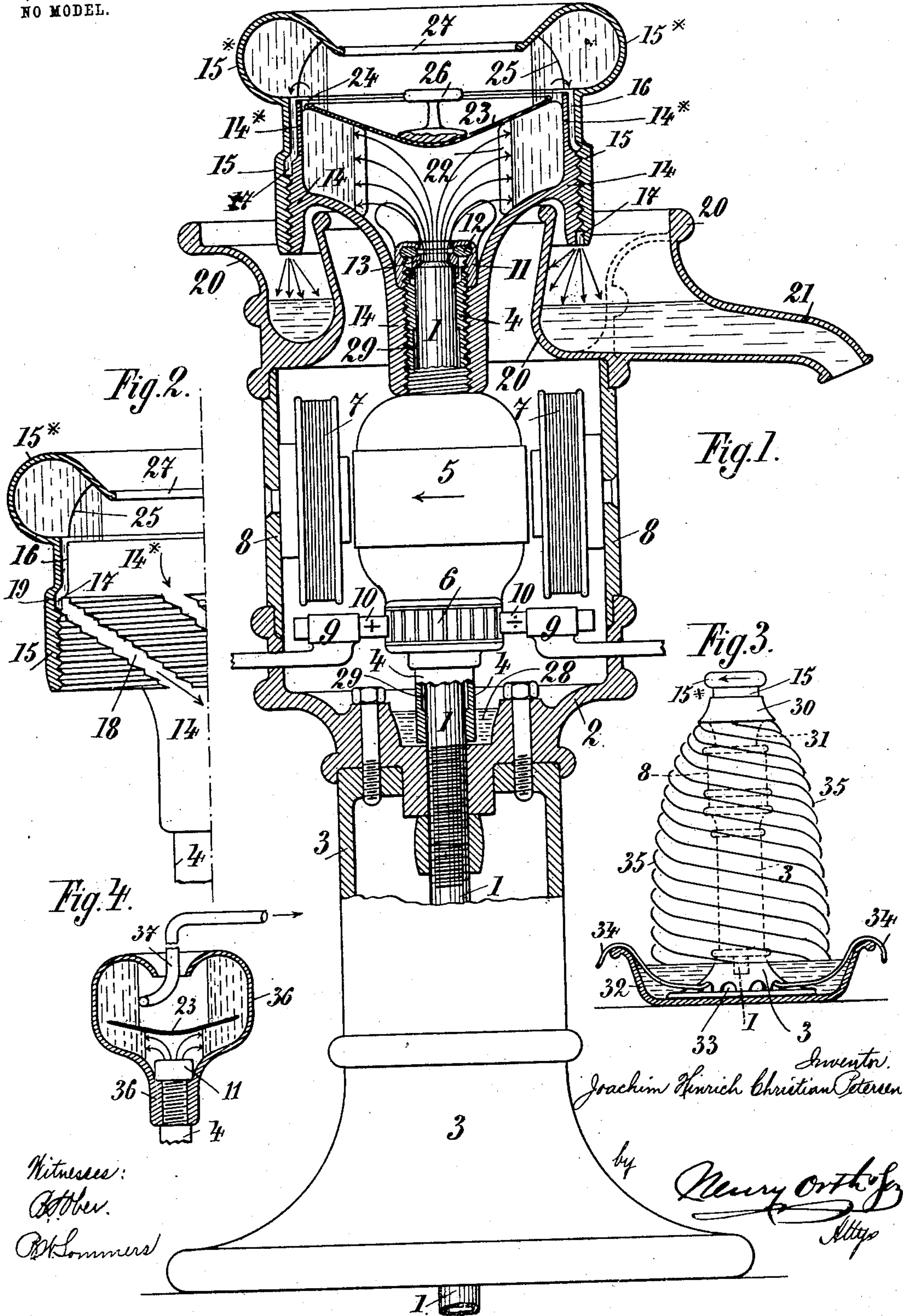


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CENTRIFUGAL SUCTION PUMP.
APPLICATION FILED DEC. 6, 1901.

NO MODEL.



UNITED STATES PATENT OFFICE.

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CENTRIFUGAL SUCTION-PUMP.

SPECIFICATION forming part of Letters Patent No. 735,900, dated August 11, 1903.

Application filed December 6, 1901. Serial No. 84,965. (No model.)

To all whom it may concern:

Be it known that I, JOACHIM HINRICH CHRISTIAN PETERSEN, a subject of the German Emperor, and a resident of Hamburg, in the Empire of Germany, have invented certain new and useful Improvements in Centrifugal Suction-Pumps, of which the following is a specification.

The present invention relates to improvements in centrifugal suction-pumps, the object of the improvements being to provide a pumping device which is simple in construction and efficient in use; and with that object in view my invention consists in certain novel features of construction and combinations of parts, as will be fully described with reference to the accompanying sheet of drawings, in which—

Figure 1 is a central vertical section of an improved centrifugal suction-pump embodying my invention. Fig. 2 is a detailed side elevation, partly in section, of the suction-head of the pump. Fig. 3 is a diagram illustrating on a smaller scale the application of my improved pump as a fountain; and Fig. 4 is a central vertical section, on a smaller scale, of a modified form of the suction-head and the means for leading off the fluid fed.

Similar numerals refer to similar parts throughout the several views.

The suction-pipe 1 is fastened in the base-plate 2 of a suitable standard 3. Upon the suction-pipe is rotatably mounted a socket 4, carrying the armature 5 and commutator 6 of a suitable electric motor, the electromagnets 7 of which are fastened to a suitable casing 8, placed upon the base-plate 2.

9 9 are the brush-supports, carrying the brushes 10, sliding upon the commutator 6, the brush-supports 9, to which the conducting-wires (not shown) are connected, being mounted in the upright flange or rim of the plate 2.

Upon the socket 4, which may be suspended from the suction-pipe 1 by means of a suitable nut 11, screwed upon the upper end of the said socket and resting upon the upper edge of the suction-pipe or upon the packing-ring 12 and sliding ring 13, inserted between such nut 11 and suction-pipe 1, is screwed the suction-head proper. This latter consists of a bell or funnel shaped body 14, having an up-

right flange 14*, and of an inverted cup 15 15*, screwed upon a thread provided on the outer periphery of the said body 14, the parts being shaped so as to leave an annular passage 16 between those parts of the walls of the body 14 and cup 15 which are not screw-threaded. From this passage 16 diverts a plurality of inclined channels 17, traversing the screw-threads of the body 14 and cup 15, these inclined discharge-channels 17 being constituted by suitable grooves 18 in the male screw-thread of the body 14 and similar grooves 19 in the female screw-thread of the cup 15, which grooves are arranged so as to register with one another when the cup 15 has been screwed home, as is evident from Figs. 1 and 2. Below the suction-head, or, more properly, the discharge-channels 17, is arranged a suitable annular gutter 20 for collecting the fluid discharged through the channels 17, as will be explained later on. The gutter 20, being provided with a spout 21 or the like, is supported by the casing 8, surrounding the electric motor.

In the interior of the bell-mouthed body 14 there are arranged radial partitions 22, and upon the upper edge of the latter is fastened a slightly-curved or cup-shaped cover 23, which, being of a somewhat smaller diameter than the inner diameter of the mouth 14* of the body 14, leaves an annular passage 24 between the rim or edge of the said cover 23 and the wall of the said body in order to enable the fluid forced by the centrifugal and sucking action of the rapidly-revolving suction-head into the radial cells or chambers formed by the partitions 22 to pass upward into the bulbed portion 15* of the cup 15. The interior of this bulbed portion may likewise be provided with radial partitions 25, if desired. The object of the partitions 22 and 25 is to support the revolving suction-head in taking around the fluid accumulated in the said suction-head near its periphery and to thus prevent the bulk of the accumulated fluid from sliding in the revolving suction-head in an opposite direction.

The suction-head body 14 14*, the partitions 22, and the cover 23 are rigidly and reliably connected with one another, so that the suction-head, the socket 4, and the parts carried by the latter may be lifted off as a whole from

the stationary suction-pipe 1 by means of a handle 26, attached to the cover 23 and accessible through an opening 27 in the bottom of the inverted cup 15 15*.

5 In order to secure a good lubrication of the socket and the suction-pipe serving as the axle for the former, the arrangement is such that the foot of the socket runs in an oil-bath 28. Moreover, before starting the pump or
10 the armature, respectively, the inner recess 29 of the socket and the free space between the socket, the supporting-nut 11, the packing-ring 12, and the sliding ring 13 are filled up with oil. Should it happen that any oil is
15 forced out through the joints at the top of the socket, fresh oil from the oil-bath will follow after and creep up along the outer surface of the suction-pipe, thus securing a copious and reliable lubricating of the speedily-revolving
20 socket.

The function or action of my improved centrifugal suction-pump is as follows: When the electric motor has been started, the socket, with the suction-head, is rotated with a very
25 high speed. In consequence of the centrifugal action the air beneath the central boss of the cover 23 is very highly rarefied, and it is this rarefaction of the air underneath the cover 23 which by its sucking action causes
30 the fluid to ascend or flow up through the suction-pipe. The fluid which flows out at the top end of the latter is at once subjected to the centrifugal action and forced outwardly against the periphery of the suction-head. By this combined sucking action of
35 the rarefaction of air and the fluid being lifted further fluid is sucked up through the suction-pipe, thereby constantly increasing the suction-power of the pump, so that after
40 a short time the fluid rushes out of the suction-pipe in a full stream, which is radially deflected immediately, and so on. The fluid accumulating in the radial cells or chambers between the partitions 22 is forced up by the
45 increased centrifugal action through the passage 24 into the bulbed portion 15*, whence it is discharged through the discharge-channels 17 into the gutter 20, finally issuing through the spout 21 as a continuous stream or jet.
50 As the discharge-channels 17 run in opposite direction to the revolving direction of the suction-head, the reaction of the fluid issuing from the discharge-channels will act to somewhat assist the rotation of the suction head
55 or pump, respectively.

The oppositely-directed issue of the fluid from the revolving suction-head enables my improved centrifugal pump to be advantageously used as a fountain. In Fig. 3 I have
60 illustrated such an application of my improved pump. For this purpose a flaring shape is given to the lower part 30 of the suction-head in order to impart to the discharge-channels 17 a slight outward direction, so that the issuing jets may flow down
65 in curves 35 of about the form shown in Fig.

3 and may therefore surround the pump structure with a bell-shaped fluid veil having twisted flutings. In the present modification the collecting-gutter 20 is of course
70 dispensed with and substituted by a suitable collar-piece 31. The pump may be placed, if desired, into a suitable basin 32, so that the same fluid may be used over and over again. Suitable holes or notches 33 in the
75 base 3 of the pump allow the fluid to pass to the suction-pipe 1. In order to not disturb the form of the fluid veil, the conducting-wires 34 may be led to the brush-supports from beneath through the suction-holes 33. 80

In some cases it may be advisable to discharge the fluid from the suction-head by means of a pressure-pipe similar to the discharge-pipes used in centrifugal machines. In Fig. 4 I have illustrated such a modified
85 form of my centrifugal pump. The suction-head 36 is in this case basket or drum shaped, and the pipe 37, through which the fluid is to be discharged, dips with its lower end into the said suction-drum 36 and into the fluid
90 bulk accumulated therein above the bulged cover 23.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is— 95

1. The combination with a suction-pipe, of a bell-shaped body revoluble thereon, partitions therein and an inverted cup secured to said bell, and partitions in the cup and suitable discharge-passages, substantially as and
100 for the purpose set forth.

2. The combination with a suction-pipe, of a bell-shaped body having an upright flange provided with threads, an inverted cup having a flange likewise threaded and secured to
105 said bell to form an annular passage between the upright flange and cup, and discharge-waterways formed in the threaded portions of the flange and bell, substantially as and for the purpose set forth. 110

3. The combination with a suction-pipe, of a bell-shaped body having an upright flange, an inverted cup secured thereto to form an annular passage between said flange and cup, partitions in both bell and cup and discharge-
115 passages between the bell and cup, substantially as and for the purpose set forth.

4. The combination with a suction-pipe, of a bell-shaped body, partitions therein, a cover for said body to leave an annular passage between said body and cover, an inverted cup
120 secured to said body to receive fluid from the bell-shaped body through said annular passage and means for discharging the fluid from the cup, substantially as and for the purpose set forth. 125

5. The combination with a suction-pipe, of a bell-shaped body, partitions therein, a cover secured to said partitions to leave an annular passage between the body to receive fluid
130 therefrom, an inverted cup secured to the body-partitions in the cup and discharge-

passages formed between the cup and bell-shaped body, substantially as and for the purpose set forth.

5 6. In a centrifugal pump, a rotatable sleeve on a suction-pipe, an armature secured to the sleeve, a casing formed in sections, and field-magnets secured to one of the sections of said casing, substantially as described.

10 7. The combination with a straight stationary suction-pipe, of a removable sleeve revoluble on the exterior thereof and hung from the ends of said pipe, a bell-shaped body and an armature secured to the sleeve and fixed field-magnets positioned around the armature, substantially as set forth.

15 8. The combination with a vertical suction-pipe, of a sleeve revoluble on and hung from the discharge end of the pipe, a bell-shaped body secured to the sleeve, partitions in the body, a base-plate forming an end bearing for the sleeve and means for supplying oil to the lower end of the sleeve, whereby the entire bearing-surface of said sleeve will be lubricated by centrifugal action, substantially
25 as and for the purpose set forth.

9. The combination with a vertical suction-pipe, of a sleeve on the discharge end thereof, a bell-shaped body having an upright flange secured to the sleeve, partitions in said body, a cover secured to the body to leave an annular passage between it and the body, an inverted cup secured to said flange, partitions in the cup, a second annular passage between the flange and cup and inclined discharge-passages leading therefrom between the bell and cup, an electric motor, the armature of which is secured to said sleeve and means for collecting the discharge fluid, substantially as and for the purpose set forth.

10. The combination with a vertical suction-pipe, of a bell-shaped body revoluble thereon, means to drive said body, means to cause a substantially downward discharge therefrom, and means at the lower end of the suction-pipe to collect discharge fluid, substantially as and for the purpose set forth.

JOACHIM HINRICH CHRISTIAN PETERSEN.

Witnesses:

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E. H. L. MUMMENHOFF.