

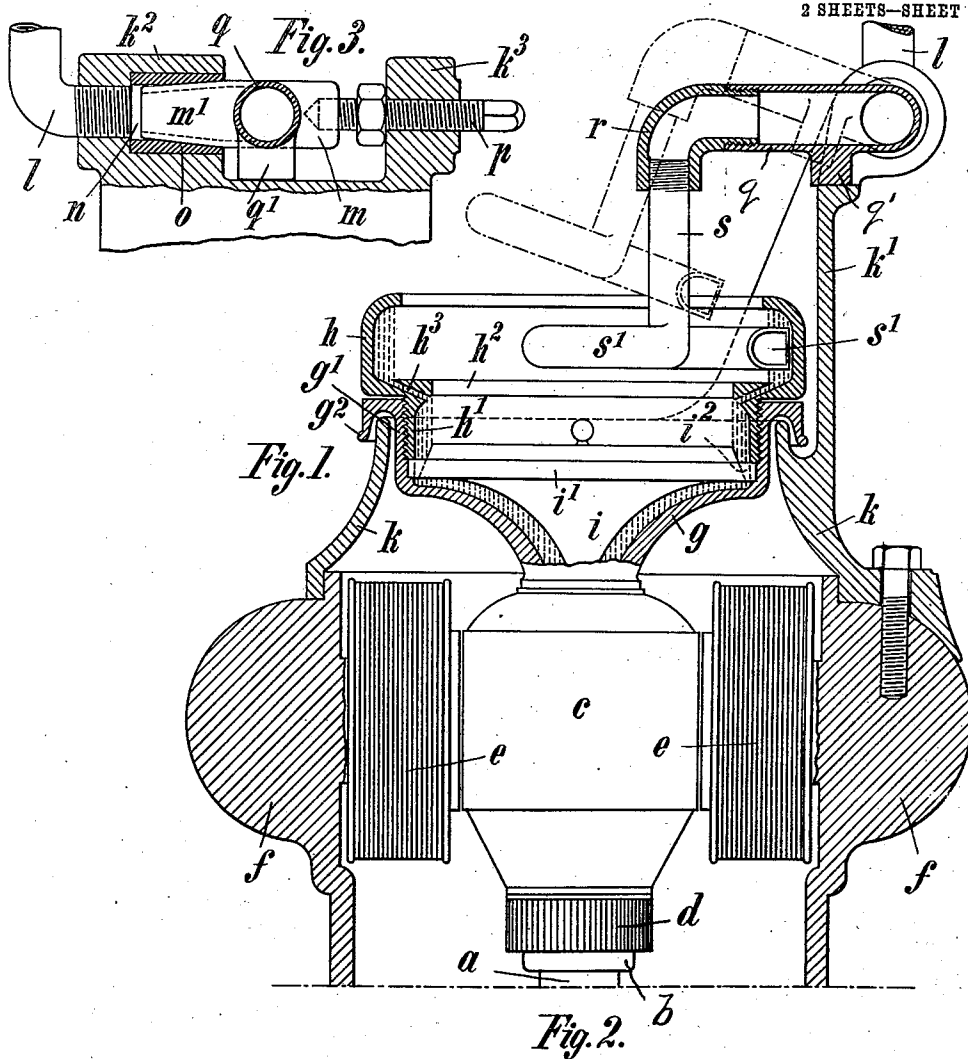
No. 810,975.

PATENTED JAN. 30, 1906.

J. H. C. PETERSEN.
CENTRIFUGAL PUMP.

APPLICATION FILED NOV. 11, 1904.

2 SHEETS—SHEET 1.



Witnesses.
Harry L. Ames.
O. Mommers

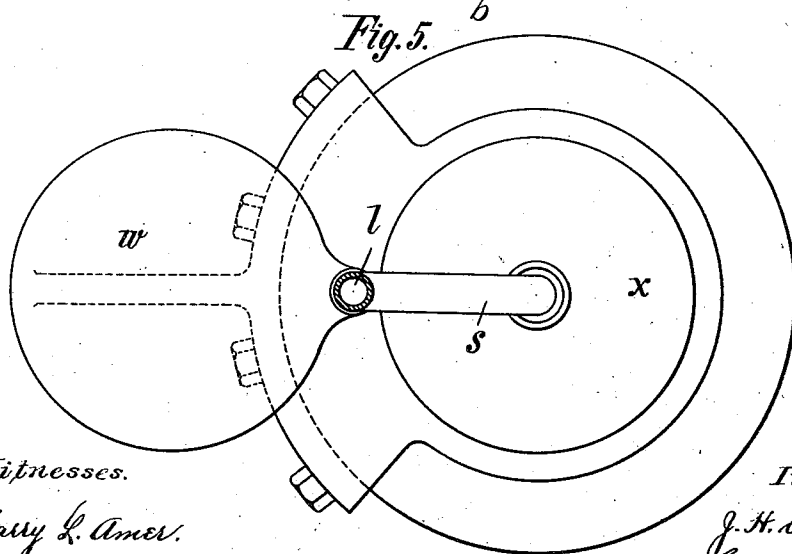
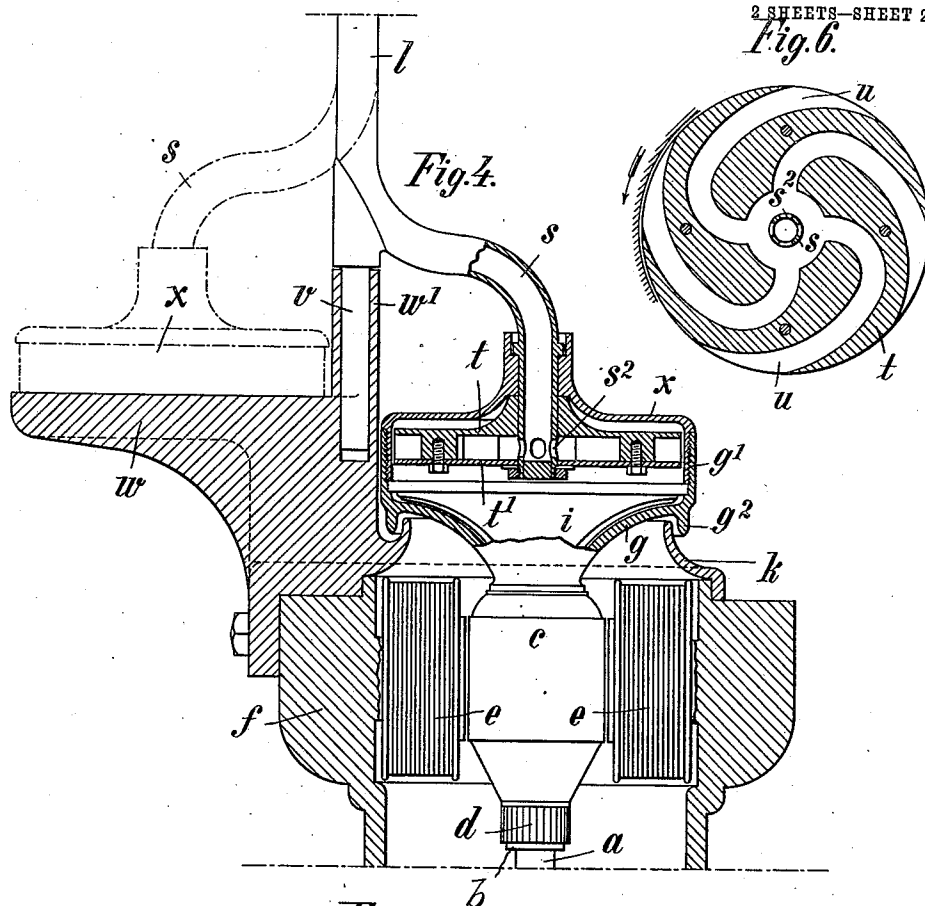
Inventor.
J. H. C. Petersen.
by Harry O. Petersen

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2 SHEETS—SHEET 2.



Witnesses.

Harry L. Amer.
C. Rommers

Inventor.

J. H. C. Petersen
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UNITED STATES PATENT OFFICE.

JOACHIM HINRICH CHRISTIAN PETERSEN, OF HAMBURG, GERMANY.

CENTRIFUGAL PUMP.

No. 810,975.

Specification of Letters Patent.

Patented Jan. 30, 1906.

Application filed November 11, 1904. Serial No. 232,371.

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 German Empire, have invented certain new and useful Improvements in Centrifugal Pumps, of which the following is a specification.

The present invention relates to improvements in centrifugal pumps of that class in which the fluid by the rotation of a suction-head arranged above the top end of a suction-pipe is caused to ascend through the said suction-pipe into the outlet passage or chamber of the suction-head, whence it is driven outwardly or discharged through a pipe or the like dipping into the fluid bulk accumulated in the chamber of the suction-head. In pumps of this character the connection between the discharge or pressure pipe and the skimming device must necessarily be fluid-tight, and for this reason the skimming device has heretofore been stationary and rigidly mounted within the suction-head and rigidly connected with the pressure-pipe. In order to remove the suction-head or disassemble the parts of the pump for repairs, it is quite necessary to remove the skimming device, and to do this it necessitates disconnecting the skimmer from the pressure-pipe, an operation which obviously is objectionable, tedious, and difficult, owing to the fluid-tight connection.

The object of this improvement is to overcome these objections by providing a skimming device adapted to skim off the fluid as it accumulates in the suction-head and to lead it into the pressure-pipe, and while being connected fluid-tight with the pressure-pipe it is also movably connected, so that it can be easily and quickly removed from out of the suction-head whenever desirable to repair the latter without in any way interfering with the pressure-pipe or destroying its connection with the skimmer; 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 sheets of drawings, in which—

Figure 1 is a central vertical section of an improved centrifugal pump embodying my invention. Fig. 2 is a top view of the suction-head and the lower part of the fluid-

skimming device, partly in section. Fig. 3 is a detailed sectional view showing the movable connection of the skimming device with the pressure-pipe conduit. Fig. 4 is a similar sectional view to Fig. 1, illustrating a modification of the skimming device and its connection with the pressure-pipe. Fig. 5 is a top view or plan of Fig. 4. Fig. 6 is a horizontal section of the skimming device shown in Fig. 4.

Similar letters refer to similar parts throughout the several figures.

Referring to Fig. 1, upon the suction-pipe *a* is rotatably mounted a socket *b*, carrying the armature *c* and commutator *d* of a suitable electric motor, the electromagnets *e* of which are fastened to the walls of the pump-casing *f*. Upon the socket *b* is fastened the suction-head, which consists of a bell or funnel shaped body *g*, having an upright flange *g'*, and of an inverted cup *h h'*, screwed into the flange part *g'*. The cup *h h'* has an inner flange *h²*, provided with a plurality of fluid-passages *h³*. Into the body *g* is inserted a whip-top-like body *i*, resting with an external flange *i'* upon a suitable shoulder in the interior of the said body *g*, the flange *i'* being provided with a plurality of passages *i²* for the fluid. To the casing *f* is fixed an annular frame or ring *k*, surrounding the body *g*, a lip *g²* of which laps over or embraces with sufficient play the upper edge of the ring *k*. The latter is furnished with an upright arm *k'*, serving as a support or carrier for the pressure or discharge pipe *l*, suitably attached to a lug *k²* of the said arm *k'*. In front of the entrance or mouth of the pipe *l* is mounted a plug-like body *m*, Fig. 3, fitting with its conical part *m'* into a suitable boring *n*, lined with a suitably-shaped socket *o*, and being held in position and in fluid-tight connection by means of an adjustable set-screw *p*, screwed through a threaded hole in the opposite lug *k²* and acting against the closed end of the plug *m*. The plug *m m'* has a nozzle *q* resting with a lug or stop-piece *q'* upon the upper face of the arm *k'*, the bores of the plug and the nozzle being at right angles. Connected to the nozzle *q* by means of a bent-down connecting-piece *r* is a tube *s*, the lower end *s'* of which is spirally bent in a plane at right angles to the axis of the tube *s*, so as to form a spiral duct dipping with its free end or mouth into the fluid bulk accumulating in the chamber

or cup *h* and adapted to skim off this fluid in the manner shown in Fig. 2.

The operation of the pump above described is well known and needs, therefore, no detailed description. Suffice it to say that when the electric motor has been started and the pump primed the sucking action of the suction-head revolving with a high speed causes the fluid to ascend or to flow up through the suction-pipe. The fluid as it flows out at the top of the latter is at once subjected to the centrifugal action and forced outwardly and upward through the trumpet-shaped passage between the walls of the bodies *g* and *i* and through the passages *i*² against the inner wall of the flange *h'*, whence it is forced up through the passages *h*³ into the cup or chamber *h*. The fluid bulk accumulating in the cup *h* is forced into the skimming-tube *s s'* and delivered through the nozzle and plug connection into the pressure-pipe through which it is to be discharged under pressure as a continuous jet. As the skimming device *s s'* has a swinging motion by the said conical plug-and-socket connection, it may, if desired, be turned upward in the manner shown by dotted lines in Fig. 1, so as to swing the said skimming device out of the way and give free access to the suction-head.

In the modification shown in Figs. 4 to 6 the spiral part *s'* of the skimming-tube is replaced by a disk *t*, attached to the tube *s* and provided with spiral ducts *u*, covered by a bottom plate *t'*, the inner ends of the spiral ducts communicating with the tube *s* through holes *s*², whereas the outer ends of the said ducts—that is to say, the periphery of the skimming-disk—are dipping into the fluid bulk. The tube *s* is rigidly connected to or branched off from the pressure-pipe *l*, and this latter is rotatably mounted with a pivot *v* into a standard *w* of a platform *w*, fastened upon the pump-casing *f*. The inverted cup *h h'* (shown in Fig. 1) is replaced in the modified form represented by Fig. 4 by an inverted cup *x*, which is rotatably, but not slidably, mounted on the tube *s*, so that the cup *x* can easily be screwed into or unscrewed from the flange part *g'* of the body *g*. The operation of this modified pump is exactly the same as that described with reference to the pump shown by Fig. 1. For removing the skimming device *s t' u*, first the cup *x* is unscrewed, the skimming device and pressure-pipe being simultaneously lifted in the same degree as the cup *x* rises. After the cup *x* has been loosened the skimming device carrying the cup *x* and the pressure-pipe are still further raised and then turned round on the pivot *v*, so as to bring the skimming device over the platform *w*, upon which it may be placed, as shown by dotted lines in Fig. 4. The skimming device is thus brought out of the way and a free access secured to interior

of the suction-head. Instead of removing the skimming device by turning it up in a vertical plane or by lifting it and swinging it aside the arrangement may also be such that the removal of the skimming device can be effected by simply raising or lifting the latter to a sufficient height in a vertical direction only.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In combination with a centrifugal pump, and its suction-head, a discharge-pipe, and a skimming device communicating with the discharge-pipe adapted to be swung into and out of the suction-head.

2. In combination with a centrifugal pump and its suction-head, a supporting element, a discharge-pipe supported by said element and a skimming device communicating with the discharge-pipe and adapted to revolve around the supporting element.

3. In combination with a centrifugal pump and its suction-head, a standard, a discharge-pipe, a conduit pivotally supported in the standard communicating with the discharge-pipe, and a spiral conduit carried by and communicating with the aforesaid conduit adapted to take into the suction-head.

4. In combination with a centrifugal pump and its suction-head, a standard, a discharge-pipe, a conduit pivotally supported in the standard communicating with the discharge-pipe, and a communicating conduit eccentric to the vertical axis of the mouth of the aforesaid conduit.

5. In combination with a centrifugal pump and its suction-head, a standard, a discharge-pipe, a conduit pivotally supported in the standard communicating with the discharge-pipe, and a conduit communicating with the aforesaid conduit-opening at the periphery of the suction-head.

6. In combination with a centrifugal pump and its suction-head, a standard, a discharge-pipe mounted therein, a hollow plug rotatably mounted in the standard communicating with the discharge-pipe, a nozzle carried by the plug, and a spiral conduit carried by the nozzle having its mouth terminating at the periphery of the suction-head.

7. In combination with a centrifugal pump and its suction-head, a standard, a discharge-pipe mounted therein, a hollow plug rotatably mounted in the standard and communicating with the discharge-pipe, a nozzle carried by and communicating with the plug, means to limit the rotation of the plug, a conduit communicating with the nozzle having a spiral portion opening into the suction-head near its inner periphery.

8. In combination with a centrifugal pump and its suction-head, a standard, a discharge-pipe mounted therein, a hollow plug rota-

ably mounted in a socket formed in the standard and communicating with the discharge-pipe, means to adjust the plug in the socket, a nozzle entering the plug at right angles to the mouth of the discharge-pipe, a conduit entering the nozzle at right angles to the longitudinal axis of the nozzle and having a spiral portion bent in a plane at right angles to its axis, said spiral portion opening at the periphery of the suction-head, and means to hold the spiral portion in a longitudinal plane. 10

JOACHIM HINRICH CHRISTIAN PETERSEN.

Witnesses:

MAX KAEMPF,

OTTO W. HELLMRICH.