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(54) **THE VALVE AND PISTON HYDROELECTRIC POWER STATION**

(57) Invention area

Hydroelectric power stations.

This invention is based on the law of communicating vessels, saying that in communicating vessels the surfaces of the same liquid are established at one level, provided that pressure over liquid in vessels is identical.

The unresolved problem consists in impossibility or high cost of a reuse of the same water. Rising it back in

to a reservoir will lead to bigger energy consumption, than electricity produced at its falling.

Also unresolved problem is the impossibility of installation of hydroelectric power station in any convenient place in the absence of already available water flow.

The valve and piston hydroelectric power station solves these problems.

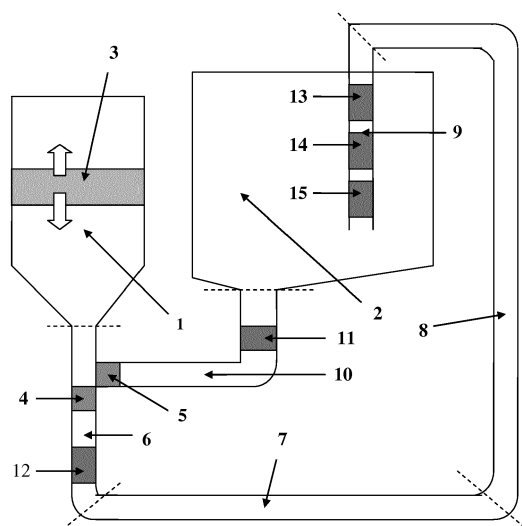


Figure 1.

- 1 – capacity
- 2 – capacity
- 3 – heavy piston.
- 4, 5 – valves.
- 6, 7, 8, 9, 10 – tubes.
- 11, 12, 13, 14, 15 – turbines of the electric generators.
- Tubes borders

Description

Invention area

Hydroelectric power stations.

[0001] This invention is based on the law of communicating vessels, saying that in communicating vessels the surfaces of the same liquid are established at one level, provided that pressure over liquid in vessels is identical.

[0002] The level of equipment includes the generating turbine putted in action by water or other liquid.

The level of equipment includes hydroelectric power stations in which water flow under the influence of force of terrestrial gravitation, rotates generating turbines.

[0003] The unresolved problem consists in impossibility or high cost of a reuse of the same water. Rising it back in to a reservoir will lead to bigger energy consumption, than electricity produced at its falling.

[0004] Also unresolved problem is the impossibility of installation of hydroelectric power station in any convenient place in the absence of already available water flow, especially on river and sea vessels and platforms.

[0005] The Valve and piston hydroelectric power station solves these problems.

The mechanism of the device

[0006] The device is shown in figure 1. It consists of two capacities with liquid, for example, water, or anti-freeze connected among themselves by tubes in which are established the valves and the turbines of the generators. In the capacity (1) having a cylinder form, or parallel walls, the freely moving heavy piston (3) is installed. This heavy piston (3) is pushing its weight on liquid. The mass of the piston has to seriously exceed the greatest possible weight of entire liquid in a tube (7) that not only to lift water in it and to twist the turbine, but also to compensate piston (3) friction force with walls of a vessel (1).

[0007] Liquid, flowing in the tubes from one capacity to another, rotates turbines of the generators and produces the electricity.

[0008] The piston (3) has to adjoin most densely to walls of the capacity (1), or have sealing rings not to allow infiltration of liquid through it, or allow infiltration at the extremely minimum level. Then it has to be equipped with the device of collecting water and pumping it in the capacity (2).

[0009] The mass of liquid in the capacity (2) which is higher than a level of a bottom of the capacity (1) has to be equal or more, than the doubled sum of mass of the maximum ammount of the liquid which can be located in the capacity (1) and the mass of the piston in the capacity (1).

The technical process

[0010] The process consists of two consistently re-

peating cycles.

[0011] In the first cycle the piston in the capacity (1) is in the lower point, the valve (4) is closed, the valve (5) opens and the liquid from the capacity (2) thanks to force of terrestrial gravitation, starts flowing to the tube (10), rotating the generating turbine (11) and getting to the capacity (1) it lifts the piston (3) until the mass of the liquid in the capacity (2) which is higher than a level of a bottom of the capacity (1) isn't equaled with the sum of mass of liquid in capacity (1) and the mass of the piston (3), or until the piston (3) reaches the top point.

[0012] In the second cycle the piston (3) in the capacity (1) is in the top point, the valve (5) is closed, the valve (4) opens and the liquid from the capacity (1), under the influence of force of terrestrial gravitation and pressure of mass of the piston (3), which force of terrestrial gravitation also affects, follows to the tube (6) forcing out the liquid which is already available in it, rotating the generator turbine (12).

[0013] After that the liquid through the tube (7) flows into the tube (8) and under the pressure of the mass of the piston (3) rises upward. From the tube (8) the liquid under pressure gets to the tube (9) and being even more accelerated under the influence of force of terrestrial gravitation, falls in to the capacity (2), thus rotating generating turbines (13),(14),(15).

[0014] The cycle comes to an end when the piston (3) reaches its lowest point.

Application options

[0015] This mechanism can be used not only for production of an electricity as it is described above, but also to make other mechanical work, replacing with itself others engines in the industry and agriculture, such as engines of machines, konveer, mills, threshers, press, pumps, river crafts and so on.

Indisputable advantage is environmental friendliness, universality of application, big possible power and lack of need for any fuel.

The additional parameters.

[0016] The more the mass of the piston (3) exceeds the mass of liquid in the tube (8), the quicker and more powerfully the liquid stream is rotating the turbines (12), (13),(14),(15) and the shorter is a time of the cycle.

[0017] The more mass of liquid in the capacity (2) which is over the a level of a bottom of the capacity (1) exceeds the doubled sum of mass of the maximum ammount of the liquid which could be entered in capacity (1) and the mass of the piston in the capacity (1), the quicker and more powerfully the liquid stream will rotate the generator turbine (11) and the shorter cycle time will be.

[0018] The higher is the point of connection of tubes (8) and (9), the more height of falling of liquid is higher, and the turbines (13),(14),(15) rotate more strongly.

[0019] Existence of several turbines in the tube (9) isn't

obligatory, but it is useful. If putting the only one turbine more higher, all energy of falling of liquid won't be used. If putting the only one turbine lower, in process of filling of the capacity (2), liquid, falling and hitting the liquid which is already available in the tube, will extinguish the energy.

[0020] However, for simplification and reduction in cost of a design of hydroelectric power station, especially at execution in rather small sizes, generating turbines in the tube (9) can be absent, and the tube can be shorter, thus the efficiency of hydroelectric power station will be lowered.

[0021] Also some turbines may be connected to the common generator.

[0022] The piston in the capacity (1) can be equipped with the directing constructions, it will make the power station more reliable and durable.

[0023] The mechanism has to be equipped with the sensors of the lowest and the top positions of the piston (3) giving a signal on opening and closing to valves (4) and (5).

The range of use

[0024] This Valve and piston hydroelectric power station is universal in application, can be applied both in land execution, and on sea and river crafts and platforms. Its construction is possible in any available place and is limited only actually to the level of the used construction equipment and suitability of the environment for the service personnel.

[0025] Use of nonfreezing liquid allows to use this hydroelectric power station in northern latitudes.

[0026] Use of liquids with more high temperature of boiling will allow to use this hydroelectric power station without any problems in southern latitudes and hot deserts.

[0027] Also, depending on the sizes, this Hydroelectric power station can be established on the motor transport, in particular, cargo and special, and even on balloon aircrafts.

the same time it twists the blades of the turbines, producing electricity or making other mechanical work and lifts up the heavy piston in the first capacity. To do this, the mass of liquid in the second capacity which is higher than a level of a bottom of the first capacity has to be equal or to exceed the doubled sum of mass of the maximum ammount of the liquid which can be located in the first capacity and the mass of the piston. Otherwise the piston wouldn't rise till it's possible top point or the piston wouldn't rise at all an the cycle shall not go.

In the second cycle the liquid under pressure of it's own weight and mass of the piston flows back through another tube from the first capacity into the top of the second capacity, at the same time it also twists blades of turbines in a tube, producing electricity or making any other mechanical work, also when falling in to a capacity the liquid can twist turbines too and do a useful work.

The mass of the piston has to seriously exceed the greatest possible weight of entire liquid in a tube which is higher than a bottom level of the first capacity, because it has to not only to lift water in this tube and to twist the turbine, but also to compensate a piston friction force with walls of a vessel.

Claims

1. The Valve and piston hydroelectric power station

The system consists of two capacities with a liquid connected by tubes. In the first capacity having a cylinder form, or parallel walls, the freely moving heavy piston is installed. This heavy piston is pushing its weight on liquid. In at the exit from capacities and in tubes the amount of valves is installed, this valves are regulating from which to which capacity the liquid will flow.

The process consists of two continuing cycles

In the first cycle a part of the liquid under the power of gravitation and it's own mass flows from the second capacity to the first capacity through a tube, at

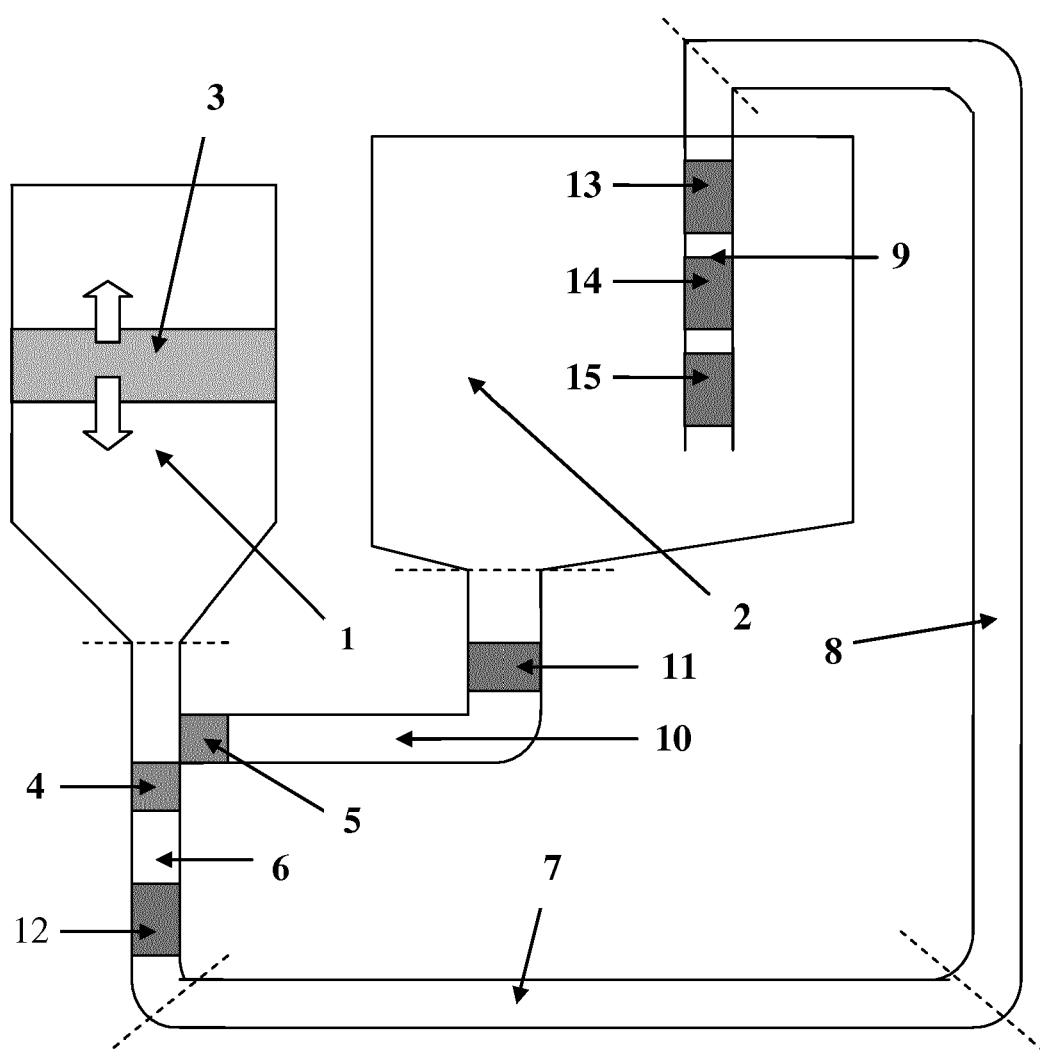


Figure 1.

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EUROPEAN SEARCH REPORT

Application Number
EP 16 02 0046

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 11 November 2016	Examiner Di Renzo, Raffaele
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 16 02 0046

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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11-11-2016

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82