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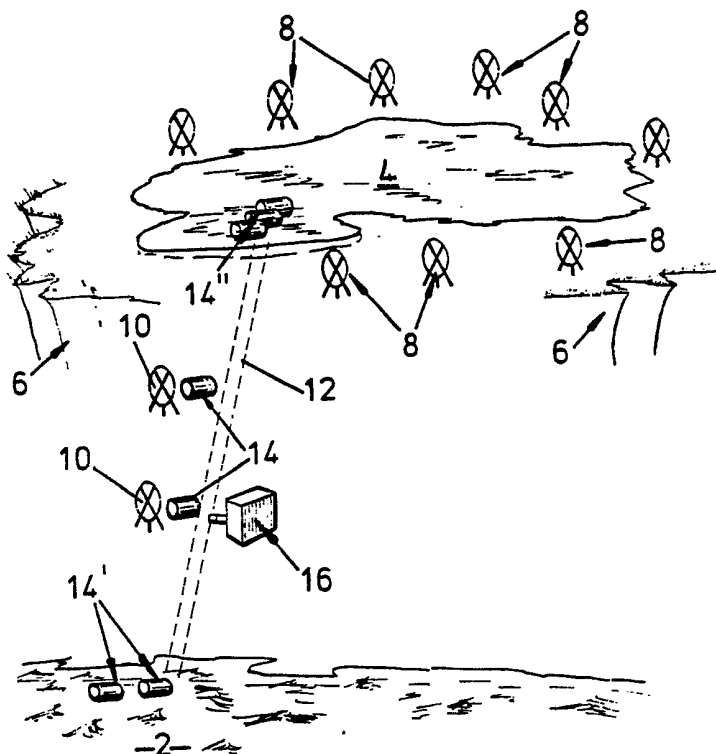
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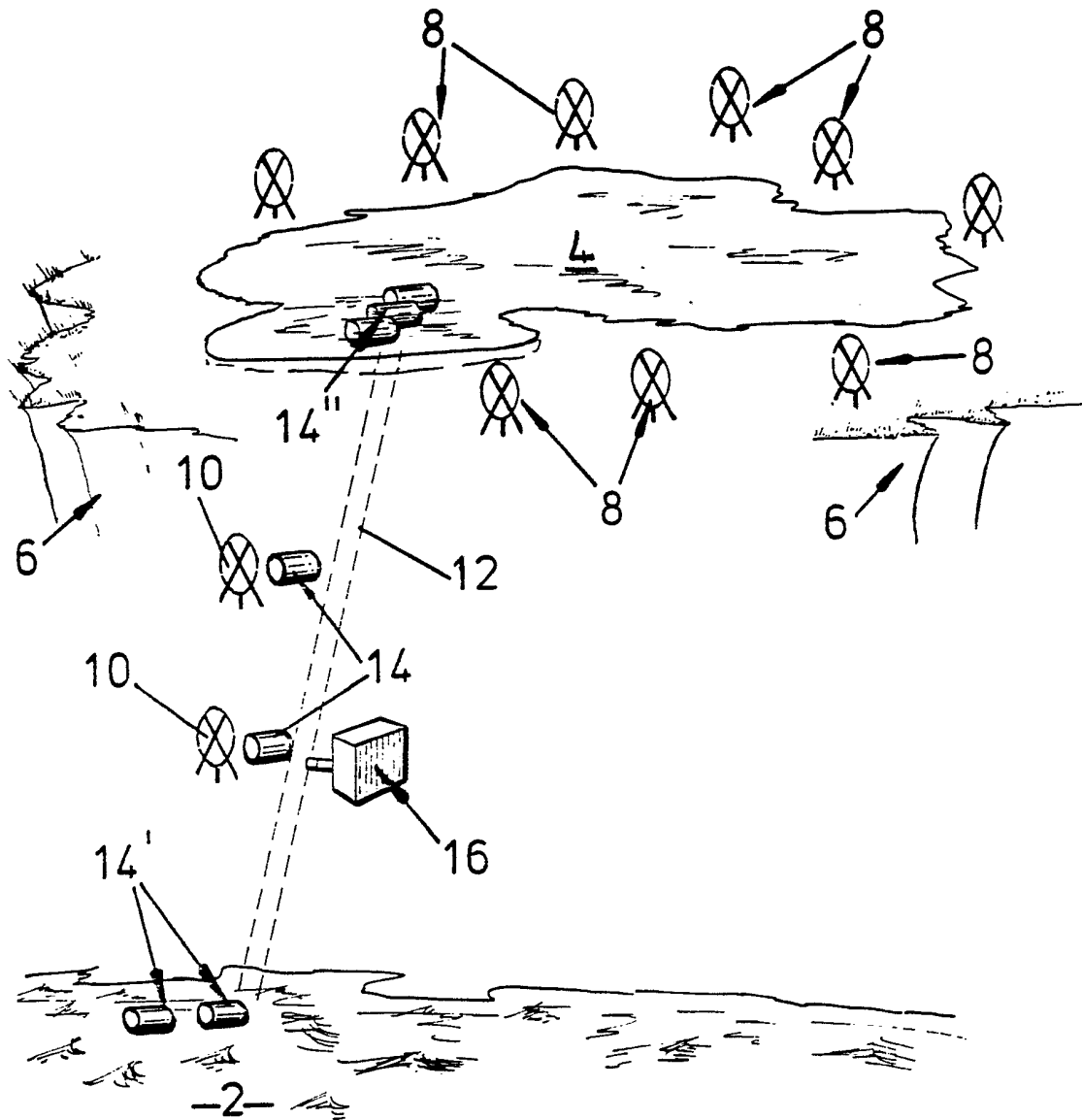
**UK CL (Edition J) F1Q**

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**(54) Power generation using wind power and pumped water storage**

(57) In an electricity generating system, wind-harnessing devices 8 are provided for operating generators 16. The generators are provided adjacent a water flow path 12 between a first low-level, body of water 2 and a second, high-level, body of water 4. Pump devices 14, 14' and 14" are driven by wind-harnessing devices 10, during windy conditions to raise water up said path 12 to the high-level water body 4. When there is no wind, water may be allowed to return under gravity to the low-level body of water 2 and in doing so turn the turbines of the generator 16 to maintain the electrical output thereof.





ELECTRICITY GENERATING SYSTEMS

The invention relates to electricity generating systems.

It is known that a certain usable output of electricity may be generated from harnessing the power of the wind to operate a generating system. Such systems are usually only effective when the site is exceptionally open and frequently subject to conditions of wind, often accompanied by storm. More consistent efficiency may be achieved with hydroelectric systems using water from a river fall, reservoir or mountain lake, but this is only possible where annual rainfall is reasonably copious.

The present invention provides an electricity generating system wherein there are provided a plurality of wind-drivable generator means arranged at an area adjacent to but elevated with respect to a first, permanent, body of water, a plurality of rotary wind harnessing devices arranged near to and at a higher level than said generator means and adapted to operate the latter, pump devices adapted to raise water from said body of water to a second, more highly elevated, body of water, and standby water power operated means to operate said generator means, the construction and arrangement being such that the generator means are operable by wind alone when weather conditions permit, but by water power at other times, means being provided

for allowing water in said second body of water to flow to said first body and to operate said generator means according to weather conditions.

Conveniently, said pumps may be wind power operated or, if preferred, means may be provided to divert a portion of the electrical output of the generators to said pumps while said generators are operated by wind-power.

Preferably, the first body of water may be the sea, the second body of water being a reservoir situated at an elevated site on cliffs overlooking the sea. Alternatively the second body may be a valley lake or reservoir and the first body a mountainside reservoir.

If appropriate, a series of reservoirs may be provided, with the facility for water to be siphoned from one to the other as required.

In an example of the invention described below, the wind-harnessing devices are situated around the perimeter of the second body of water and at intervals up the flow path of water to be pumped from the first body to the second body of water. Pump devices may be arranged within the first and second bodies of water and at intervals therebetween.

The example will now be described with reference to the drawing. It will be understood that the description is given by way of example only, and not by way of limitation.

The drawing shows diagrammatically a first body of water, the sea 2, and a second body of water, a reservoir 4, positioned at the top of cliffs 6. A plurality of wind-harnessing devices 8 is arranged around the reservoir and further such devices 10, are arranged along a flow path 12 through which water is pumped up from the sea 2 by pumps 14, which are powered from the devices 10. Further groups of pumps 14' and 14" are provided in the first and second bodies of water, 2 and 4, respectively.

When there is insufficient wind for the devices 8 to operate generator means 16, the water from the reservoir 4 is allowed to flow back into the sea and in doing so, turns the turbines of the generator means 16 to maintain an output of electricity.

Various modifications may be made within the scope of the invention as defined in the following claims.

CLAIMS:

1. An electricity generating system wherein there are provided a plurality of wind-driven generator means arranged at an area adjacent to but elevated with respect to a first, permanent, body of water, a plurality of rotary wind harnessing devices arranged near to and at a higher level than said generator means and adapted to operate the latter, pump devices adapted to raise water from said body of water to a second, more highly elevated, body of water, and standby water power operated means to operate said generator means, the construction and arrangement being such that the generator means are operable by wind alone when weather conditions permit, but by water power at other times, means being provided for allowing water in said second body of water to flow to said first body and to operate said generator means according to weather conditions.
2. A system as claimed in claim 1 wherein said pumps are directly wind-power operated.
3. A system as claimed in claim 1 wherein means are provided to divert a portion of the electrical output of the generators to said pumps while the generators are operating by wind-power.
4. A system as claimed in any one of the preceding claims, wherein the first body of water is the sea and the second body of water is a reservoir at an elevated site.

5. A system as claimed in any one of claims 1 to 3 wherein the first body of water is a valley reservoir and the second body of water is a mountain reservoir.
6. A system as claimed in either one of claims 4 and 5, wherein said second body of water comprises a series of reservoirs, siphon means being provided for enabling water to pass from one of said series to the next.
7. A system as claimed in any one of the preceding claims wherein the wind harnessing devices are situated around the perimeter of the second body of water.
8. A system as claimed in claim 7, wherein further wind-harnessing devices are situated at intervals along the flow path of water to be pumped from the first body to the second body of water.
9. A system as claimed in any one of the preceding claims wherein said pump devices are arranged in a plurality of groups, a first group within the first body of water, a second group within the second body of water and a third group at intervals along the flow path of water to be pumped from the first body to the second body of water.
10. An electricity generating system constructed, arranged and adapted to operate substantially as hereinbefore described with reference to and as shown in the drawing.