

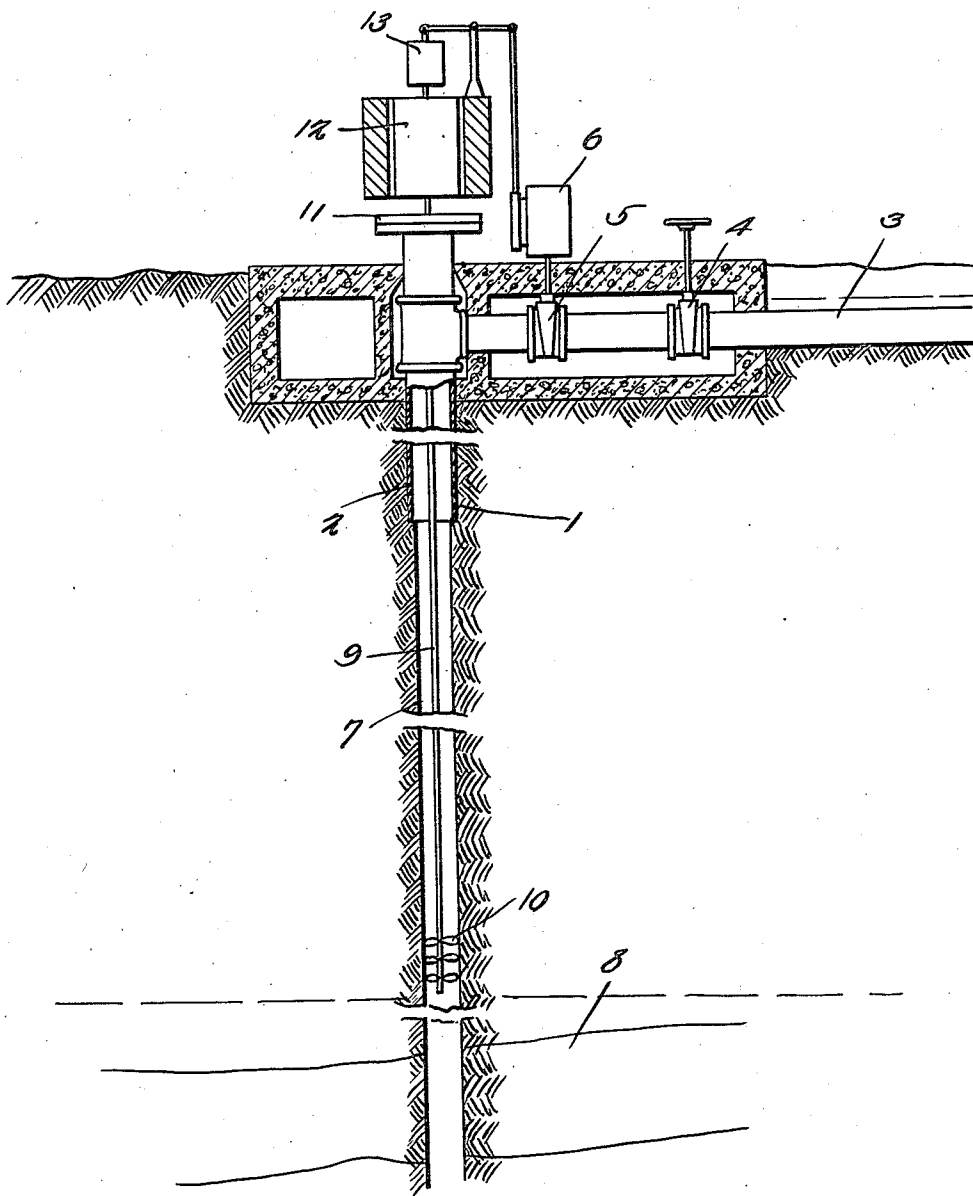
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N. HADDEN

METHOD AND APPARATUS FOR UTILIZING POTENTIAL HYDRAULIC ENERGY

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UNITED STATES PATENT OFFICE.

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METHOD AND APPARATUS FOR UTILIZING POTENTIAL HYDRAULIC ENERGY.

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To all whom it may concern:

Be it known that I, NIAL HADDEN, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Method and Apparatus for Utilizing Potential Hydraulic Energy, of which the following is a specification.

This invention relates to a method and an apparatus for utilizing potential hydraulic energy, and has for an object to transform such energy into available hydraulic power without assistance from natural water falls or swiftly moving currents.

It is a well known fact that there are numerous streams of water flowing below the surface of the ground and that there are subterranean strata which carry away water or are capable of carrying away water.

The present invention aims to take advantage of this natural condition to produce a flow from bodies of water such as ponds, lakes, rivers, streams and springs located at, or comparatively near, the surface of the earth to a subterranean water-carrying stratum, and to utilize the flow thus produced to transform the potential energy of the water into available power.

The invention may be carried out by drilling a well downwardly from the surface of the earth to a subterranean water-carrying stratum and conducting water from a body of water located at, or comparatively near, the surface of the earth into the upper portion of the well. Any known form of water propelled mechanism, hydraulic power producer, or power unit, may be located so that it is actuated by the downward flow of the water in the well. The power produced in the mechanism may be used to operate an electrical generator, or for any other purpose desired.

In the accompanying drawings which is a view partly in section and partly in elevation, there has been shown a complete apparatus embodying the present invention.

Referring to the drawing by characters of reference, 1 designates a bored well extending to a point below the level of the bottom of the nearest bodies of water and this well 1 is lined or cased with metal tubing or the like indicated at 2 and which extends up to the surface of the ground where it communicates, through a conduit 3 or the like,

with the nearest body of water so that there will be a flow of water from said body to the interior of the tubing 2. The conduit 3 may be provided with a hand controlled valve 4 for regulating the flow of water to the well and, if desired, another valve 5 can be utilized, the operation thereof being controlled by a hydraulic governor valve indicated generally at 6 and which can be of any construction desired.

From the bottom of the well 1 there is bored another well 7 which extends downwardly through the rock until a lower water-carrying stratum, indicated generally at 8, is reached. In some instances the well will open downwardly into an underground current flowing in the stratum 8. It is not essential, however, that there should be such a current of water in the stratum 8 before the apparatus is placed in operation. It should be understood, therefore, that the expression "water-carrying stratum" as used in this specification, and in the claims, signifies any geological formation that will actively conduct away water delivered to it. Thus it will be seen that when the valves 4 and 5 are opened the water flowing through the conduit 3 to the tubing 2 will travel downwardly to the water-carrying stratum 8 and then flow off at a lower level. In many instances the water-carrying stratum slopes for a considerable distance before reaching an outlet but as long as the water will flow out as rapidly as it is discharged into the well, the desired results can be obtained.

A shaft 9 is suspended in the well and is provided with any suitable propellers or the like adapted to be actuated by the downward flow of water in the well. The upper end of the shaft is supported by the tubing in any suitable manner, as by means of a bearing 11 designed to receive the thrust and the upper end of the shaft can be connected to an electrical generator, such as indicated generally at 12. A governor indicated diagrammatically at 13 is provided for controlling the actuation of the valve 6 so that the water will be gradually cut off or turned on through the conduit 3 to maintain the rotation of the shaft 9 uniform. This mechanism can be of any general well known type and for that reason need not it is thought be described or shown in detail.

It will be obvious that by providing a

system such as described water power can be obtained in many places where there is no natural water fall and no quickly moving current. All that is required is a subterranean water-carrying stratum in proximity to a body of water, either still or flowing at an elevation above said stratum so that by boring the well to said water-carrying stratum the necessary downward flow through the well can be effected.

The invention is by no means limited to the particular method and apparatus which has been described in detail for the purpose of illustration. Thus under certain conditions of the soil, the metal casing 2 may be eliminated, or may be extended to a length greater than that shown in the drawing. Furthermore, any desired form of water propelled power producing mechanism may be substituted for that shown in the drawing.

What is claimed is:—

1. The method of transforming potential hydraulic energy into available water power which comprises forming a passage from a body of water to a lower subterranean water-carrying stratum, installing a power unit in the said passage, and thereafter directing the said water through the said unit and into the said stratum.

2. Apparatus for utilizing potential hydraulic energy including a well cased to a point below the bottom level of an adjacent body of water and extended downwardly to a lower water carrying stratum, means for conducting water into the cased portion of the well from the adjacent body of water, and mechanism suspended within the well for actuation by a water current flowing downwardly through the well and means controlled by the actuation of said mechanism for regulating the flow of water to the cased portion of the well, thereby to maintain uniform actuation of the mechanism.

3. The herein described method of utilizing potential hydraulic energy which consists in forming a well extending from the surface to a lower water carrying stratum, casing the upper portion of the well to a level below the bottom of an adjacent body of water, positioning a water propelled mechanism within the well above the lower end thereof, and directing water from the adjacent body into the cased portion of the well for delivery at the lower water carrying stratum.

4. The method of utilizing potential hydraulic energy, which comprises conducting water from a body of water to a subterranean water-carrying stratum located below the level of said body of water, and utilizing the flow of water thus produced to operate a hydraulic power producer.

5. Apparatus for utilizing potential hydraulic energy, comprising a substantially vertical well extending downwardly to a subterranean water-carrying stratum, means for conducting water into a portion of said well above said stratum, and a water propelled power producing mechanism located so as to be actuated by the downward flow of said water in the well.

6. Apparatus for utilizing potential hydraulic energy, comprising water propelled power producing mechanism located below the level of a body of water and above the level of a subterranean water-carrying stratum, a conduit connecting the body of water with said mechanism, and a conduit connecting said mechanism with said stratum.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

NIAL HADDEN.

Witnesses:

EMILY J. THOMPSON,
BEN. S. THOMPSON.