

(12) **United States Patent**
Gagnon et al.

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(54) **APPARATUS FOR REHABILITATING AN UNDERGROUND WATER CONDUIT AND DETECTING AND DRILLING A SERVICE ENTRANCE IN THE CONDUIT**

(58) **Field of Classification Search**
CPC G01V 3/08; G01V 3/081; G01V 3/12
USPC 138/89, 92, 94, 104; 343/721;
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See application file for complete search history.

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(56) **References Cited**

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(57) **ABSTRACT**

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An apparatus for rehabilitating an underground water conduit having at least one service entrance including a plug having a light emitter which is responsive to the presence of an electromagnetic field, wherein the at least one service entrance is plugged with the plug and a semi-transparent membrane lining the internal surface of the underground water conduit thereby covering the plug. A drilling head is disposed on a body moveable within the underground water conduit, the drill head having a drill bit and a coil inductor concentric with the drill bit. The coil inductor is adapted to generate an electromagnetic field near the drilling head, wherein the light emitter of the plug is adapted to be turned on by the electromagnetic field emitted by the coil inductor to allow visual alignment of the drill bit with the light emitted by the light emitter through the semi-transparent membrane. The plug is drilled with the drill bit through the semi-transparent membrane in order to reopen the at least one service entrance.

Related U.S. Application Data

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8 Claims, 5 Drawing Sheets

