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(71) Applicant: **INNOVA HYDROGEN CORP.** [CA/CA];
P.O. Box 15137, Aspen Wood PO, Calgary, Alberta T3H
0N8 (CA).

(72) Inventors: **ARRISON, Norman Leroy**; #457, 2750 -
55 Street NW, Edmonton, Alberta T6L 7H5 (CA). **AL-**
FORD, Brian; 260099 Mountain Ridge Place, Rocky View
County, Alberta T4C 2Y1 (CA). **BOBOCEL, Donald**
Camille; 261149 Glendale Road, Rocky View County,
Alberta T4C 2Y8 (CA). **DESROCHES, Matthew**; 4940
19 Ave N.W., Calgary, Alberta T3B 0S9 (CA). **GILES,**
Kamelia Lee; 8223 Fortress Drive SW, Calgary, Alberta
T3H 0T8 (CA). **WILLIAMS, III, Howell Benjamin**; 648
Stumphole Road, Elloree, South Carolina 29047 (US).

(74) Agent: **HUNTER, Christopher N.** et al.; Blake, Cassels
& Graydon LLP, Commerce Court West, 199 Bay Street,
Suite 4000, Toronto, Ontario M5L 1A9 (CA).

(54) Title: APPARATUS AND METHOD FOR PRODUCING GRAPHENE AND HYDROGEN

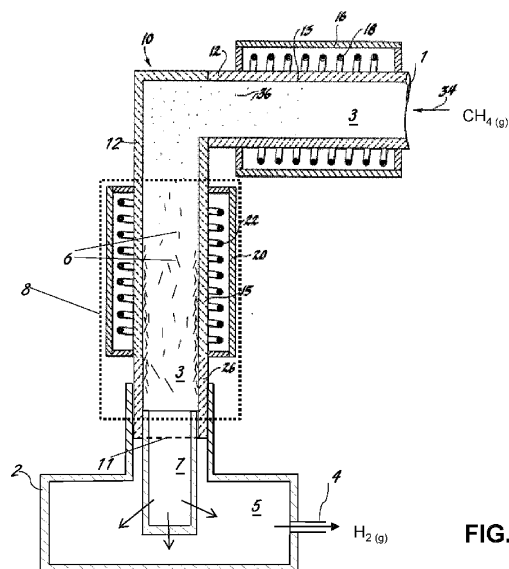


FIG. 1

(57) **Abstract:** Described are a method and apparatus for producing graphene by pyrolysis of hydrocarbons from a hydrocarbon feedstock and for recovering hydrogen gas which is a byproduct of the pyrolysis and which may be present in the hydrocarbon feedstock. The apparatus may comprise: an elongate reactor having: a first end and a second end, the first end being configured to receive a hydrocarbon feedstock; a channel defined therein for conveying a fluid between the first and second ends, wherein the fluid is a reaction mixture comprising the hydrocarbon feedstock; a terminal section attached to the second end, the terminal section being selectively permeable to hydrogen gas and impermeable to other components of the reaction mixture; and a hydrogen collection section attached to the second end to receive hydrogen gas from the terminal section, the hydrogen collection section being impermeable to hydrogen gas.

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