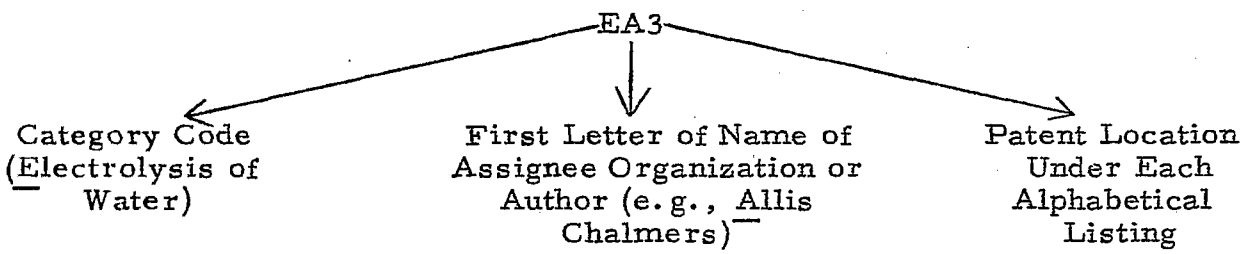
APPENDIX C. Patented Hydrogen-Production Processes

Note: The patents in each category are arranged according to assignee organization (or author, if the name of the organization was not available) and are then chronologically ordered under each organization. Each patent is assigned an alphanumeric code as explained below:



In the text, the patents are referred to by this alphanumeric code. The category codes are shown in Table 10-1.

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ELECTROLYSIS OF WATER

EA1. "Electrolytic Apparatus Adapted for Oxygen and Hydrogen Production From Water," W. G. Allan, U.S. 1,508,758, (1924) September 16.

EA2. "Electrolytic Cell Adapted for Decomposing Water," J. M. Allen, U.S. 1,467,080 (1923) September 4.

EA3. "Electrolytic Method for producing Oxygen and Hydrogen," L. W. Buechler (assigned to Allis-Chalmers Manuf. Co.), U.S. 3,410,770 (1968) November 12.

EA4. "Electrolytic Cell," H. H. Spengler and T. J. Kempher (assigned to Allis-Chalmers Manufg. Co.), Brit. 1,139,615 (1969) January 8.

EA5. "Rotating Electrolytic Cell Assembly," T. B. Hoover (assigned to Applied Science Laboratories, Inc.), U.S. 3,119,759 (1964) January 28.

EA6. "Electrolytic Production of Hydrogen and Oxygen," H. Shalit (assigned to Atlantic Richfield Co.), Ger. Offen. 1,958,385 (1970) September 24.

EB1. "Electrolytic Production of Hydrogen and Oxygen," R. Auerbach (assigned to Pintsch Bamag), Ger. 1,103,307 (1961) March 30.

EB2. "Electrodes for Decreasing Excess-Voltage Effects in the Electrolytic Manufacture of Hydrogen and Oxygen," (assigned to Pintsch Bamag), Brit. 989,003 (1965) April 14.

EB3. "Apparatus for Electrolytic Production of Hydrogen and Oxygen," L. M. Proskuryakov and V. G. Zizin (assigned to Bashkir Scientific-Research Institute of Petroleum Refining), Brit. 1,127,078 (1968) September 11.

EB4. "Electrolysis Cell for Generating Hydrogen and Oxygen," L. M. Proskuryakov and V. G. Zizin (assigned to Bashkir Scientific-Research Institute of Petroleum Refining), Ger. 1,268,602 (1968) May 22.

EB5. "Electrolysis of Water," E. Bauer, Ger. 345,048 (1921) December 5.

EB6. "Electrolytic Cell Adapted for Generating Oxygen and Hydrogen From Water," E. O. Benjamin, U.S. 1,344,220 (1919) June 22.

EB7. "Apparatus for Producing Hydrogen and Oxygen by Electrolysis of Water," M. Boisen, U.S. 1,380,183 (1921) May 31.

EB8. "Electrolytic Cell for Generating Hydrogen and Oxygen," D. A. Brading, U.S. 1,452,589 (1923) April 24.

EB9. "Electrolytic Cell for Generating Oxygen and Hydrogen," J. B. Burdett, U.S. 1,368,206 (1921) February 8.

EC1. "Apparatus for Generating Hydrogen and Oxygen Electrolytically," A. B. Carmichael, U.S. 2,365,330 (1944) December 19.

EC2. "Electrolytic Hydrogen Source," J. Jansta and O. Lasota (assigned to Ceskoslovenska Akademie Ved), Ger. Offen. 2,239,658 (1973) February 15.

EC3. "Electrolysis of Dilute Electrolytes While Heated," E. Citovich, Brit. 303,027 (1927) December 24.

EC4. "Electrolytic Oxygen and Hydrogen Production," E. G. Clark, U.S. 1,476,284 (1924) December 4.

EC5. "Pressurized Electrolytic Cell," G, Bertrand, P. Perroud and S. B. Martial (assigned to Commissariat a l'Energie Atomique), Fr. Demande 2,126,928 (1972) November 17.

EC6. "Electrolytic Production of Hydrogen," E. J. Wasp and P. A. C. Cook (assigned to Consolidation Coal Co.), U.S. 3,180,813 (1965) April 27.

EC7. "Electrolytic Production of H and O," B. P. Sutherland, J. B. Thompson, C. H. Simpkinson and D. D. Morris (assigned to Consolidated Mining and Smelting Co. of Canada, Ltd.), Can. 408,311 (1942) November 3.

EC8. "Addition Agent for Caustic Alkali Electrolytes Used in the Production of Hydrogen and Oxygen," (assigned to Consolidated Mining and Smelting Co. of Canada, Ltd.), Brit. 570,233, (1945) June 28.

EC9. "Electrolytic Production of Hydrogen and Oxygen," B. P. Sutherland, J. B. Thompson, C. H. Simpkinson and D. D. Morris (asssigned to Consolidated Mining and Smelting Co. of Canada, Ltd.), U.S. 2,433,871 (1948) January 6.

EC10. "Apparatus for Electrolytic Production of Hydrogen From Water," E. M. Crawford, U.S. 1,913,429 (1933) June 13.

ED1. "Apparatus for the Electrolytic Production of Gases," W. Schulz (assigned to Demag-Elektrometallurgie G.m.b.H.), Ger. Offen. 1,949,691 (1971) April 8.

ED2. "Apparatus for Electrolytic Decomposition of Water," Demag-Elektrometallurgie G.m.b.H., Ger. 954,956 (1956) December 27.

ED3. "Electrolysis of Aqueous Solutions," H. Walde, (assigned to Demag-Elektrometallurgie G.m.b.H.), Ger. 1,022,194 (1958) January 9.

ED4. "Electrolysis of Water," Oronzio de Nora-Impianti Elettrochimici, Fr. 1,379,177 (1964) November 20.

ED5. "Diffuse Porous Electrode With a Functional Charcoal Layer for the Production of Alkaline Hydrogen or Metal Peroxide Solutions by Cathodic Reduction of Oxygen in Aqueous Alkaline Electrolytes," J. Divisek, K. Motlik, J. Vachuda and W. Havlicek, Czech. 143,739 (1971) November 15.

ED6. "Apparatus for Electrolysis of Water," A. Dohmen U.S. 1,211,687 (1917) January 9.

EE1. "Electrode for Cells Producing Pure Oxygen and Hydrogen," F. T. Bacon (assigned to E. R. A. Patents Ltd.), U.S. 2,928,783 (1960) March 15.

EE2. "Hydrogen and Oxygen From Electrolysis of Water," K. Sasaki and R. Matsui (assigned to East Asia Synthetic Chemical Industries Co.), Japan. 3671 (1954) June 23.

EE3. "Electrolytic Apparatus," W. J. Mahany (assigned to Electro-Cell Corp.), U.S. 3,330,755 (1967) July 11.

EE4. "Apparatus for Generating Hydrogen and Oxygen by Electrolysis of Water," C. F. Euler, U.S. 1,234,319 (1917) July 24.

EG1. "Liquid Hydrogen and Oxygen," R. S. Rae (assigned to Garrett Corp.), Brit. 804,235 (1958) November 12.

EG2. "Electrolytic Cell for Producing Hydrogen and Oxygen From Water," E. Geeraerd, U.S. 1,308,704 (1919) July 1.

EG3. "Electrically Coupled Fuel Cell and Hydrogen Generator," D. W. White (assigned to General Electric Co.), U.S. 3,607,427 (1971) September 21.

EG4. "Oxyhydrogen Gas Generator," F. Getz, Ger. Offen. 2,159,246 (1973) June 14.

EG5. "Electrolytic Cell for Decomposing Water," A. M. Griffin, U.S. 1,327,094 (1920) January 6.

EH1. "Electrolytic Cell for Oxygen Production," G. Haas, Ger. 2,144,989 (1973) August 16.

EH2. "Electrolysis Apparatus," G. Haas, Ger. Offen. 1,909,852 (1970) September 17.

EH3. "Electrolytic Cell," J. Harris, U.S. 1,297,157 (1919) March 11.

EH4. "Electrolytic Cell Adapted for Generating Hydrogen and Oxygen," J. Harris, U.S. 1,420,037 (1922) June 20.

EH5. "Electrolytic Cells," J. Harris, Can. 211,543 (1921) May 17.

EH6. "Electrolytic Production of Hydrogen and Oxygen," W. A. Rhodes, (assigned to Henes Manufg. Co.), U.S. 3,394,062 (1968) July 23.

EI1. "Electrolytic Generator for Oxygen and Hydrogen," J. Inoue, Jap. 38,551 (1921) May 2.

EI2. "Electrodes for Electrolytic Cells," J. R. Hall and J. T. Van Gemert (assigned to Imperial Chemical Industries of Australia and New Zealand Ltd.), U.S. 3,291,714 (1966) December 13.

EI3. "Electrodes for Electrolytic Cells," (assigned to Imperial Chemical Industries of Australia and New Zealand Ltd.), Brit. 1,004,380 (1965) September 15.

EI4. "Automatic Laboratory Apparatus for Obtaining Hydrogen and Oxygen," N. M. Guseinov, I. A. Ismailov, K. A. Lyutaliev, S. Kh. Teregulov, and Yu. G. Polyakov (assigned to Institute of Petrochemical Processes), U.S.S.R. 298,373 (1971) March 16.

EJ1. "Electrolysis of Water," G. F. Jaubert, Fr. 731,917, (1931) April 18.

EK1. "Electrolyte for Electrolyzing Water," I. Sinya and R. Ono (assigned to K. K. Hitati Seisakujo), Japan 93,762, (1931) November 30.

EK2. "Rapid-Current Electrochemical Reaction," M. Kawakami, Japan 4563 ('52), (1953) November 6.

EK3. "Decomposing Liquids to Gases," A. Kilgus, Brit. 401,688, (1933) November 13.

EK4. "Electrolytic Gas Generator," B. Klein, U.S. 2,373,032, (1945) April 3.

EK5. "Electrolytic Cell for Hydrogen and Oxygen Production From Water," A. E. Knowles, U.S. 1,485,461 (1924) March 4.

EK6. "Electrolytic Apparatus for Producing Hydrogen and Oxygen from Water," P. J. Kroll, U.S. 1,306,151 (1919) June 10.

EL1. "Cell for the Generation of Oxygen and Hydrogen," I. H. Levin, Brit. 102,933 (1919) October 27.

EL2. "Electrolytic Apparatus for Generating Oxygen and Hydrogen From Water," I. H. Levin, U.S. 1,214,934 (1917) February 6.

EL3. "Electrolytic Cell for Generating Oxygen and Hydrogen From Water," I. H. Levin, U.S. 1,219,206 (1917) March 20.

EL4. "Electrolytic Gas Generators," I. H. Levin, Can. 193,482 (1919) October 28.

EL5. "Electrode for Cells Producing Oxygen and Hydrogen," I. H. Levin, U.S. 1,360,545 (1921) November 30.

EL6. "Electrolytic Apparatus of the Filter-Press Type," I. H. Levin, U.S. 1,360,541 (1921) November 30.

EL7. "Electrolytic Apparatus Adapted for Production of Oxygen and Hydrogen," I. H. Levin, U.S. 1,360,542 (1921) November 30.

EL8. "Electrolytic Cell for Producing Oxygen and Hydrogen From Water," I. H. Levin, U.S. 1,372,442 (1921) March 21.

EL9. "Electrolytic Cell Adapted for Producing Oxygen and Hydrogen From Water," I. H. Levin, U.S. 1,504,359 (1924) August 12.

EL10. "Pressure Electrolysis in Filter-Type Equipment," (assigned to Lonza Elektrizitatswerke und chemische Fabriken), Swiss 286,097 (1953) February 2.

EL11. "High-Pressure Electrolyzer," E. A. Zdansky, (assigned to Lonza Elektrizitatswerke und chemische Fabriken Akt.-Ges.), Swiss 330,814 (1958) August 15.

EL12. "Decreasing the Hydrogen Overvoltage at the Cathodes of Electrolytic Cells Used for the Production of Hydrogen and Oxygen," E. A. Zdansky, (assigned to Lonza Elektrizitatswerke und Chemische Fabriken Akt.-Ges.), Swiss 331,841 (1958) September 30.

EL13. "Activation of the Cathode Surfaces of Electrolytic Hydrogen Generators," E. A. Zdansky, (assigned to Lonza Elektrizitatswerke und Chemische Fabriken Akt.-Ges.), Swiss 340,810 (1959) October 31.

EM1. "Electrolytic Apparatus for Decomposing Water," A. J. MacDougall, U.S. 1,324,511 (1920) December 9.

EM2. "Electrodes," (assigned to Maschinenfabrik Oerlikon), Swiss 161,836 (1933) August 1.

EM3. "Electrolytic Apparatus for Decomposing Water," (assigned to Maschinenfabrik Oerlikon), Swiss 181,800 (1936) April 1.

EM4. "Bipolar Electrolyzers for the Production of Hydrogen and Oxygen," (assigned to Maschinenfabrik Oerlikon), Brit. 543,671 (1941) March 9.

EM5. "Bipolar Electrolyzers," (assigned to Maschinenfabrik Oerlikon), Brit. 539,358 (1941) September 12.

EM6. "Bipolar Electrolyzers," (assigned to Maschinenfabrik Oerlikon), Brit. 539,865 (1941) September 26.

EM7. "Electrolyzer Cell Adapted for Water Decomposition and Gas Separation," W. Boller (assigned to Maschinenfabrik Oerlikon), U.S. 2,350,669 (1944) June 6.

EM8. "Electrolysis Cell," (assigned to Machinenfabrik Oerlikon), Swiss 215,396 (1941) September 16.

EM9. "Lowering the Cell Potential in Electrolyzer Equipment Used for the Preparation of Hydrogen and Oxygen," (assigned to Maschinenfabrik Oerlikon), Swiss 257,714 (1949) April 1.

EM10. "Apparatus and Method for Electrochemical Preparation for Hydrogen from Water Vapor and Nitrogen From Air," H. H. Moebius and B. Rohland, Ger. (East) 85,336 (1971) October 20.

EM11. "Electrolytic Apparatus for the Production of Hydrogen and Oxygen," (assigned to "Montecatini" Soc. Generala Per L Ind. Mineraria Ed Agricola), Fr. 654,289 (1928) May 14.

EM12. "Electrolysis Apparatus for Production of Pure Gases," J. Moritz, Fr. 1,536,290 (1968) August 16.

EM13. "Electrolyzers for the Production of Oxygen and Hydrogen Under Pressure," J. Moritz, Fr. 1,418,875 (1965) November 26.

EN1. "Storage Battery Serving Also for Electrolytic Production of Gases Such as Hydrogen," H. Niederreither, U.S. 1,980,873 (1935) November 13.

EN2. "Generating Oxygen and Hydrogen at High Pressure Electrolytically," J. E. Noeggerath, Brit. 245,119 (1924) December 19.

EO1. "Utilization of the Heat of Oxidation of Oxidizable Metals in Power Plants," M. F. Offner, Ger. 1,040,571 (1958) October 9.

EO2. "Apparatus for Electrolylic Decomposition of Water," H. Olsen, Ger. 682,019 (1939) September 14.

EO3. "Electrolytic Decomposition Apparatus," H. Olsen, Ger. 683,796, 683,797 and 683,798 (1939) October 26.

EP1. "Apparatus for Producing Hydrogen and Oxygen From Water," L. M. Proskuryakov and V. G. Zizin, U.S. 3,433,729 (1969) March 18.

ER1. "Operating an Electrolysis Cell for the Production of Gases Under Hydrostatic Pressure," J. L. Reynolds, U.S. 3,652,431 (1972) March 28.

ER2. "Pressure Electrolyzer of Water," R. C. Ryman, U.S. 2,494,264 (1950) January 10.

ES1. "Oxygen and Hydrogen," J. P. Scott, Brit. 210,102 (1922) July 25.

ES2. "Apparatus for the Electrolytic Production of H From Aqueous Electrolyte Solutions Such as One of KOH and Na_2SO_3," F. Sledzianowski, (1944) August 22.

ES3. "Electrolytic Apparatus for Generating Oxygen and Hydrogen From Water," L. P. Sebille, U.S. 1,222,809 (1917) April 17.

ES4. "Electrolytic Apparatus for Producing Oxygen and Hydrogen From Water," L. P. Sebille, U.S. 1,230,803 (1917) June 19.

ES5. "Electrolytic Cell for Producing Oxygen and Hydrogen," D. Shaw, U.S. 1,208,722 (1917) December 12.

ES6. "Electrolytic Cell Adapted for Obtaining Oxygen and Hydrogen From Water," R. M. Shaw, U.S. 1,346,849 (1917) July 20.

ES7. "Storage Battery-Fuel Cell for Converting Electricity to Hydrogen and Oxygen and Vice Versa," (assigned to Siemens, A.-G. and Varta A.-G.), Fr. 1,548,347 (1968) December 6.

ES8. "Electrolysis of Water," (assigned to Siemens and Halske A.-G.), Fr. 822,473 (1937) December 30.

ES9. "Electrolysis of Water," (assigned to Siemens and Halske A.-G.), Fr. 828,740 (1938) May 27.

ES10. "Water-Electrolysis Apparatus, With Concentric Electrodes," (assigned to Siemens and Halske A.-G.), Ger. 668,141 (1938) November 26.

ES11. "Apparatus for Electrolytic Decomposition of Water," L. Schirmer, (assigned to Siemens and Halske Akt.-Ges.), Ger. 682,913-14 (1939) October 5.

ES12. "Electrolytic Cell for Decomposing Water," L. Schirmer, (assigned to Siemens and Halske A.-G.), Ger. 672,909 (1939) March 11.

ES13. "Electrolysis of Water," O. von Pichler, (assigned to Siemens and Halske A.-G.), Ger. 672,851 (1939) March 10.

ES14. "Electrolysis of Water By Means of Concentric Electrodes," H. Olsen, (assigned to Siemens and Halske Akt.-Ges.), Ger. 690,098 (1940) March 21.

ES15. "Concentric Electrolytic Water Hydrolyzer," A. v. Pichler, (assigned to Siemens and Halske Akt.-Ges.), Ger. 691,872 (1940) May 9.

ES16. "An Apparatus for the Electrolytic Decomposition of Water," A. v. Pichler (assigned to Siemens and Halske Akt.-Ges.), Ger. 699,491 (1940) October 31.

ES17. "Electrolytic Production of Hydrogen," W. Birett (assigned to Siemens and Halske Akt.-Ges.), Ger. 701,803 (1940) December 24.

ES18. "Concentric Apparatus for Electrolytic Decomposition of Water," A. v. Pichler, (assigned to Siemens and Halske Akt.-Ges.), Ger. 701,900 (1940) December 24.

ES19. "Electrolytic Water Decomposer Built Like a Filter Press," H. Spengler, (assigned to Siemens and Halske A.-G.), Ger. 711,536 (1941) September 4.

ES20. "Apparatus for Electrolytic Decomposition of Water," H. Dahling, (assigned to Siemens and Halske A.-G.), Ger. 718,790 (1942) February 26.

ES21. "Conducting Electrochemical Processes," L. I. Kadaner, R. B. Avakyan and G. S. Skovorod, (assigned to State Pedagogical Institute, Kharkov), U.S.S.R. 328,931 (1972) February 9.

ES22. "Electrolytic Cell for Oxygen and Hydrogen or Other Gas Production," A. K. Smith, U.S. 1,442,238 (1923) January 16.

ES23. "Oxyhydrogen Gas Generator for Brazing and Welding," E. Spirig, Ger. Offen. 2,202,739 (1973) July 26.

ES24. "Hydrogen and Oxygen by Electrolysis of Aqueous Alkali Solutions," E. T. Johnson, (assigned to Stockholms Superfosfat Fabriks A/B), Swed. 152,784 (1955) December 27.

ES25. "Device for Producing Hydrogen and Oxygen by Means of a Water Electrolyzer," P. Stoltz, Fr. 850,671 (1939) December 22.

ES26. "Electrolytic Cell Adapted for Decomposing Water," A. T. Stuart, U.S. 1,303,519 (1919) May 13.

ES27. "Electrolytic Decomposition of Water," A. T. Stuart, U.S. 1,965,813 (1934) July 10.

ET1. "High Pressure Electrolysis System and Process for Hydrogen-Oxygen Generation," A. M. Lord and T. H. Hacha (assigned to TRW Inc.), U.S. 3,374,158 (1968) March 19.

ET2. "An Apparatus for the Electrolysis of Water," R. Hyakutani, (assigned to Taihei Yoko Co.) Japan 612(54) (1954) February 4.

ET3. "Preparation of Pure Hydrogen Gas," I. Shiratori and T. Kinokami, (assigned to Tokyo Shibaura Electric Co., Ltd.), Japan 71 05,561 (1972) February 12.

ET4. "Electrolysis of Water," Ya. I. Tur'yan, U.S.S.R. 66,685 (1946) July 31.

ET5. "Electrolyzer for Water," Ya. I. Tur'yan, U.S.S.R. 66,872 (1946) August 31.

EU1. "Zero Gravity Electrolysis Apparatus," M. D. Rutkowski, (assigned to United States Dept. of the Air Force), U.S. 3,379,634 (1968) April 23.

EV1. "Electrochemical Manufacture of Hydrogen From Water Vapor and Nitrogen From Air," (assigned to VEB Petrolchemische Kombinat Schwedt), Fr. 2,125,729 (1972) November 3.

EV2. "Apparatus for Producing Gases From Liquids Electrolytically," F. S. Vincent, U.S. 1,398,658 (1922) November 29.

EV3. "Device for the Electrolytic Generation of Hydrogen," G. B. Vinogradov, Ger. Offen. 1,944,967 (1971) March 11.

EW1. "Hydrogen From Water," A. Werlen, T. Kuenemann, E. Silbermann and C. Goetsch, Fr. 693,637 (1930) January 21.

EZ1. "Apparatus for Producing a Hot Flame for Welding and Soldering by Electrolysis of Water," I. Boschnakow and G. Buness, (assinged to Zentralinstitut fuer Schweisstechnik der Deutschen Demokratischen Republik), Ger. Offen. 2,034,471 (1971) March 18.

ELECTROLYSIS OF IMPURE WATER AND OTHER SOLUTIONS

IA1. "Hydrogen," D. V. Adamovich and A. M. Klimushin, Russ. 51, 562 (1937) August 31.

IA2. "Electrolytic Cell for Decomposing Sodium Chloride Solutions," H. I. Allen, U.S. 1,355,116 (19) October 12.

IA3. "Electrolysis of Aqueous Hydrochloric Acid," (assigned to Asahi Chemical Industry Co., Ltd.), Brit, 1,004,207 (1965) September 15.

IB1. "Cell for Electrolytic Decomposition of Hydrochloric Acid or Aqueous Chloride Solutions," W. Honsberg and W. Schwab, (assigned to Badische Anilin- and Soda-Fabrik Akt.-Ges), Brit. 839,275 (1960) June 29.

IB2. "Removing Salts From Water by Electrolysis," J. Billiter, Austrian 122,783 (1930) April 15.

IB3. "Sea-Water Activated Battery," L. J. Burant, and R. M. Fiandt, U.S. 3,427,201 (1969) February 11.

IC1. "Manufacture of Chlorine, Sodium Hydroxide and Hydrogen by Electrolysis of Alkaline Chlorides in Mercury Cells," (assigned to Ciba Ltd.), Belg. 635,848 (1964) February 5.

IC2. "Manufacture of Chlorine, Sodium Hydroxide, and Hydrogen by the Electrolysis of Sodium Chloride in Mercury Cells," A. Goerg, (assigned to Ciba Ltd.), U.S. 3,407,128 (1968) October 22.

ID1. "Cells for the Production of Chloride From Hydrochloric Acid," G. Messner, (assigned to Cronzio de Nora-Impianti Electrochimici), U.S. 3,236,760 (1966) February 22.

IE1. "Simultaneous Production of Inorganic Alkali Salts and of Chlorine," U. Gardella, G. Morandi and A. Omacini, (assigned to Edison-Settore Chimico), Belg. 621,091 (1963) February 3.

IF1. "Hydrogen," G. Pfleiderer, (assigned to I. G. Farbenind, A.-G.), U.S. 1,818,579 (1931) August 11.

IF2. "Galvanic Hydrogen Producer," M. Fidelman, U.S. 3,256,504 (1966) June 14.

IG1. "Electrolyzing Double Sulfates of Sodium or Potassium and Aluminum," G. Gallo, Brit. 354,255 (1930) May 1.

IG2. "Electrochemical Generation of Hydrogen," W. N. Carson, Jr. and J. L. Manganaro, (assigned to General Electric Co.), U.S. 3,616,335 (1971) October 26.

IG3. "Generating Hydrogen With Magnesium Reactant," W. N. Carson, Jr. and J. L. Manganaro, (assigned to General Electric Co.), U.S. 3,703,358 (1971) November 21.

IH1. "Electrolysis," (assigned to K. Heinemann and Hoesch and Co.), Brit. 171,751 (1920) August 14.

IH2. "Electrolysis of Aqueous Solutions of Inorganic Salts," S. G. Osborne and G. T. Miller, (assigned to Hooker Chemical Corp.), Ger. 1,111,155 Appl. (1953) December 22.

IH3. "Method for Electrolysis," S. G. Osborne and G. T. Miller, (assigned to Hooker Chemical Corp.), U.S. 3,220,941 (1965) November 30.

II1. "Active Anode and Electrolytic Cell," (assigned to Imperial Metal Industries Ltd.), Neth. Appl. 6,402,526 (1964) September 14.

IJ1. "Electrolytic Cells," W. M. Jewell, Can. 211,901 (1921) May 24.

IK1. "Diaphragm Electrolytic Cells," G. M. Kamaryan, Fr. 1,381,442 (1964) December 11.

IK2. "Diaphragm Electrolyzer for the Production of Chlorine, Hydrogen, and Alkalis," G. M. Kamaryan, Fr. 1,397,589 (1965) April 30.

IK3. "Electrolytic Diaphragm Cell for Production of Chlorine, Hydrogen, and Alkalies," G. M. Kamaryan, U.S. 3,498,903 (1970) March 3.

IK4. "Electrolytic Cell for the Production of Alkali," L. I. Krishtalik and N. I. Men shakova, U.S.S.R. 111,780 (1958) June 25.

IL1. "Chlorine and hydrogen by Electrolysis of Hydrochloric Acid," F. S. Low, Brit. 350,479 (1930) March 7.

IM1. "Preparation of Pure Hydrogen," (assigned to Matsushita Electric Industrial Co., Ltd.), Fr. 1,517,243 (1968) March 15.

IM2. "Sodium Amalgam Decompostion," G. Barthel and G. Haas, (assigned to Metallgesellschaft A.-G.), Brit. 1,131,895 (1968) October 30.

IM3. "Sea Water Electrolysis Cell," K. Ueda, (assigned to Mitsubishi Heavy Industries, Ltd.), Ger. Offen. 2,023,751 (1971) January 7.

IN1. "Electrolysis of Aqueous Solutions of Mixtures of Potassium Chloride and Sodium Chloride," F. Casciani and E. J. Lang, (assigned to Niagara Alkali Co.), U.S. 2,715,608 (1965) August 16.

IN2. "Hydrogen From Electrolysis," K. Kanzaki (assigned to Noguchi Research Institute, Inc.), Japan 178,878 (1949) May 18.

IO1. "Working Up Natural Waters," (assigned to Osterreichische Gesellschaft fur Energieforschung m.b.H.), Austrian 176,204 (1953) September 25.

IP1. "Cell for the Decomposition of the Mercury Amalgam and Retention of Hydrogen Under Pressure," F. Sciacca and G. Conforto, (assigned to P.S.P. Ingg. Piani-Sciacca-Piacentini), Ital. 441,069 (1948) October 23.

IP2. "Electrolytic Production of Pure Chlorine, Hydrogen, and Concentrated Alkali Metal Phosphate Solution," J. L. Butre and F. Pierrot, (assigned to Progil S.A.), Ger. Offen. 2,124,045 (1971) November 25.

IS1. "Electrolytic Cell Suitable for Producing Chlorine, Hydrogen and Caustic Soda From a Sodium Chloride Solution," G. E. Schiffbauer, Jr. and J. T. McCluskey, U.S. 2,306,757 (1942) December 29.

IS2. "Removal of Mercury Vapor From Electrolytic Hydrogen," B. Kawase, I. Kojima and K. Otani, (assigne to Showa Denko K.K.), Ger. Offen. 2,130,945 (1971) December 30.

IS3. "Chlorine and Hydrogen From Hydrogen Chloride," J. Schick, (assigned to Siegner A.-G. fuer Eisenkonstruktion, Brueckenbau und Verzinkerei), Ger. 1,156,056 (1963) October 21.

IS4. "Purification of Hydrogen by Removal of Mercury," G. G. Garifzyanov, V. R. Khalilov, R. B. Valitov and A. S. Stepanov, (assigned to Sterlitamak Chemical Plant), U.S.S.R. 341,754 (1972) June 14.

IS5. "Electrolytic Production of Hydrogen, Chlorine, and Magnesium Hydroxide From Magnesium Chloride Solutions," M. Suchi, J. J. Koch and R. Proft, Ger. (East) 62,819 (1968) July 20.

IS6. "Hydrogen, Chlorine, and Magnesium Hydroxide by Electrolysis of Sea Water," K. Suzuki, Japan 172,112 (1946) January 9.

IT1. "Direct Electrolysis of Sea Water," T. Ono, and C. Okunaga, (assigned to Teijin Ltd.), Japan 70 30,451 (1970) October 2.

IT2. "Hydrogen and Chlorine From Hydrogen Chlorine," H. L. Slatin, (assinged to Timax Association), U.S. 3,453,187 (1969) July 1.

IU1. "Electrolytic Multi-Cells With Diaphragms and Bipolar Titanium Electrodes for Brine Electrolysis," L. Mose, B. Strasser, H. Hund and W. Kramer (assinged to Uhde, Friedrich, G.m.b.H.), Ger. Offen. 2,148,337 (1973) April 5.

IU2. "Chlorine From Hydrochloric Acid-Containing Gases," L. S. Kassel, (assigned to Universal Oil Products Co.), U.S. 2,719,822 (1955) October 4.

IU3. "Chemical Cycle for an Evaporative Water Desalination Plant," R. E. Blanco, W. E. Clark and W. C. Yee, (assinged to U.S. Dept. of the Interior), U.S. 3,463,814 (1969) August 26.

IV1. "Electrolytic Decomposition Cell," (assigned to VEB Elektrochemisches Kombinat Bitterfeld), Brit. 825,374 (1959) December 16.

IW1. "Chlorine and Hydrogen Production in an Electrolytic Cell," F. S. Low, (assinged to Westvaco Chlorine Products, Inc.), Brit. 348,792 (1930) January 27.

HYDROCARBONS AND FOSSIL FUELS

HA1. "Ammonia Synthesis Gas From Natural Gas," M. Grenier and P. Lesur, (assigned to Air Liquide), Fr. 1,386,232 (1965) January 22.

HA2. "Gas Mixture for Ammonia Synthesis," M. Guigon, A. Joly and M. Grenier, (assigned to Air Liquide), Fr. 1,515,926 (1968) March 8.

HA3. "Hydrogen From Hydrocarbons," G. Simonet and J. Quibel, (assigned to Air Liquide), Ger. Offen. 1,928,381 (1969) December 11.

HA4. "Preparing High-Purity Hydrogen and a Mixture of Hydrogen and Another Gas," G. Simonet, (assigned to Air Liquide), Ger. Offen. 2,135,122 (1972) January 20.

HA5. "Manufacture of Hydrogen and Hydrogen-Nitrogen Gas Mixtures," R. M. Bednarski, (assigned to Alco Standard Corp.), Ger. Offen. 2,043,417 (1971) April 29.

HA6. "High-Temperature Hydrocarbon Reforming Furnace," P. Von Wiesenthal, (assigned to Alcorn Combustion Co.), Fr. 1,538,588 (1968) September 6.

HA7. "Hydrogen and Carbon by Thermal Decompostion of Hydrocarbons," A. W. Burwell, (assigned to Alox Chemical Corp.), U.S. 1,717,354 (1929) June 18.

HA8. "Hydrogen," A. W. Burwell, (assigned to Alox Chemical Corp.), U.S. 1,689,858 (1929) October 30.

HA9. "Hydrogen," (assigned to Patentverwertungs A.-G. Alpina), Fr. 698,484 (1930) January 31.

HA10. "Hydrogen From Coke-Oven Gases," R. E. Battig, (assigned to Patentverwertungs A.-G. Alpina), U.S. 1,831,943 (1932) November 17.

HA11. "Catalyst for Water-Gas Shift Reaction," K. D. Ashley, S. I. Federman and W. B. Innes (assigned to American Cyanamid Co.), U.S. 2,815,331 (1957) December 3.

HA12. "Hydrogen," J. N. Haresnape and S. Hesting, (assigned to Anglo-Iranian Oil Co., Ltd.), Brit. 632,192 (1949) November 17.

HA13. "Desulfurization of Catalytic Cracking-Charge Stocks," J. N. Haresnape and F. W. B. Porter, (assigned to Anglo-Iranian Oil Co., Ltd.), Brit. 632,193 (1949) November 17.

HA14. "Catalytic Cracking and Hydrogenation," J. N. Haresnape and F. W. B. Porter, (assigned to Anglo-Iranian Oil Co., Ltd.), Brit. 632,195 (1949) November 17.

HA15. "High-Temperature Conversion of Hydrocarbons," I. M. Artyukhov, U.S.S.R. 132,352 (1960) October 5.

HA16. "Catalytic Production of Hydrogen," R. A. Kmecak and S. M. Kovach, (assigned to Ashland Oil, Inc.), U.S. 3,725,246 (1973) April 3.

HA17. "High Purity Hydrogen From Hydrocarbon-Containing Charged Material by Use of an Electrochemical Process," H. Shalit, (assigned to Atlantic Richfield Co.), Ger. Offen. 1,958,359 (1970) September 24.

HA18. "Hydrogen," F. Porter, (assigned to Atmospheric Nitrogen Corp.), U.S. 1,874,801 (1932) August 30.

HA19. "Catalysts for Promoting Reactions Such as Acetic Acid Production From Methanol and Carbon Monoxide," R. L. Brown, (assigned to Atmospheric Nitrogen Corp.), U.S. 1,998,220 (1935) April 16.

HA20. "Hydrogen From Hydrocarbon Vapor and Water Vapor," F. Porter, (assigned to Atmospheric Nitrogen Corp.), U.S. 2,013,066 (1935) September 3.

HB1. "Synthesis-Gas Reactor and Heat Exchanger," J. L. Oberg, (assigned to Babcock and Wilcox Co.), U.S. 2,862,480 (1958) December 2.

HB2. "Carbon-Black and Hydrogen From Hydrocarbons," R. F. Bacon, B. T. Brooks and H. Clark, U.S. 1,220,391 (1917) March 27.

HB3. "Catalytic Conversion of Carbon Monoxide and Water Into Carbon Dioxide and Hydrogen," R. Ludwig, F. Markert, I. Gottfried and K. Helmut, (assigned to Badische Anilin- und Soda-Fabrik Akt.-Ges), Ger. 892,745 (1953) October 19.

HB4. "Synthesis Gas From Gaseous, Liquid, or Solid Fuels," (assigned to Badische Anilin- und Soda-Fabrik), Brit. 718,774 (1954) November 17.

HB5. "Synthesis Gas by Partial Oxidation of Gaseous and Liquid Fuels," E. Bartholome, (assigned to Badische Anilin- und Soda-Fabrik Akt.-Ges.), Ger. 923,843 (1955) February 21.

HB6. "Conversion of Carbon Monoxide and Water Into Carbon Dioxide and Hydrogen," F. Markert and K. Helmut, (assigned to Badische Anilin- und Soda Fabrik), Ger. 926,127 (1955) April 7.

HB7. "Partial Catalytic Oxidation of Gaseous Hydrocarbons," E. Bartholome, H. Nonnenmacher and O. Frey, (assigned to Badische Anilin- und Soda-Fabrik Akt.-Ges.), Ger. 938,610 (1956) February 2.

HB8. "Combustion of Gaseous Hydrocarbons for Production of Carbon Monoxide and Hydrogen," E. Bartholome, A. Helms and O. Frey, (assigned to Badische Anilin- und Soda-Fabric Akt.-Ges.), Ger. 1,009,165 (1957) May 29.

HB9. "Reaction of Gaseous Hydrocarbons With Oxygen," (assigned to Badische Anilin- und Soda-Fabrik Akt.-Ges.), Brit. 775,334 (1957) May 22.

HB10. "Conversion of Gaseous Hydrocarbons Into Carbon Monoxide and Hydrogen," (assigned to Badische Anilin- und Soda-Fabrik Akt.-Ges.), Brit. 777,527 (1957) June 26.

HB11. "Manufacture of Carbon Monoxide and Hydrogen by Flameless Combustion of Gaseous Hydrocarbons," E. Bartholome, H.Nonnenmacher and P. Schmulder, (assigned to Badische Anilin- und Soda-Fabrik Akt.-Ges.), Ger. 1,013,631 (1957) August 14.

HB12. "Combustion of Gaseous Hydrocarbons for Production of Carbon Monoxide and Hydrogen," (assigned to Badische Anilin- und Soda-Fabrik Akt.-Ges.), Brit. 793,423 (1958) April 16.

HB13. "Cracking of Hydrocarbons," E. Bartholome, A. Helms and H. Nonnenmacher, (assigned to Badische Anilin- und Soda-Fabrik Akt.-Ges.), Ger. 1,041,033 (1958) October 30.

HB14. "Generation of Fuel Gases, Especially Gases for Synthesis, in a Slag-Tap Producer," F. Markert, F. Duftschmid and E. Kittel, (assigned to Badische Anilin- und Soda-Fabrik Akt.-Ges.), Ger. 1,071,265 (1959) December 17.

HB15. "Flameless Conversion of Sulfur-Containing Gaseous Hydrocarbons to Carbon Monoxide and Hydrogen," E. Bartholome, K. H. Grundler and W. Teltschik, (assigned to Badische Anilin- und Soda-Fabrik Akt.-Ges.), Ger. 1,076,634 (1960) March 3.

HB16. "Fuel Gas Preparation From Liquid Volatizable Hydrocarbons," W. Knobloch and F. Duftschmid, (assigned to Badische Anilin- und Soda-Fabrik Akt.-Ges.), Ger. 1,085,286 (1960) July 14.

HB17. "Unsaturated Gaseous Hydrocarbons and Synthesis Gas From Hydrocarbon Oils," (assigned to Badische Anilin- und Soda-Fabrik Akt.-Ges.), Brit. 853,596 (1960) November 9.

HB18. "Hydrocarbon Conversion Into Carbon Monoxide and Hydrogen," (assigned to Badische Anilin- und Soda-Fabrik Akt.-Ges.), Brit. 855,501 (1960) November 30.

HB19. "Cracking Liquid Hydrocarbons in Run-Off Gas Producers," (assigned to Badische Anilin- und Soda-Fabrik Akt.-Ges.), Brit. 858,382 (1961) January 11.

HB20. "Flameless Oxidation of Gaseous Hydrocarbons to Synthesis Gas," E. Bartholome, H. Nonnenmacher and O. Frey, (assigned to Badische Anilin- und Soda-Fabrik Akt.-Ges.), Ger. 974,909 (1961) June 15.

HB21. "Conversion of Sulfur-Containing Liquid Hydrocarbons Into Carbon Monoxide and Hydrogen in a Fluidized Bed," H. Nonnenmacher and H. Meyere, (assigned to Badische Anilin- und Soda-Fabrik A.-G.), Ger. 1, 124,927 (1962) March 8.

HB22. "Catalytic Conversion of Liquid, Nonvolatile Hydrocarbons Containing Sulfur Into Carbon Monoxide and Hydrogen," H. Nonnenmacher and H. Meyer, (assigned to Badische Anilin- und Soda-Fabrik A.-G.), Ger. 1,129,134 (1962) May 10.

HB23. "Hydrogen and Carbon Monoxide From Sulfur-Containing Hydrocarbons," H. Nonnenmacher and H. Meyer, (assigned to Badische Anilin- und Soda-Fabrik A.-G.), Ger. 1,144,239 (1963) February 28.

HB24. "Cracking of Hydrocarbons," K. Eder and P. Schmulder, (assigned to Badische Anilin- und Soda-Fabrik A.-G.), Belg. 622,194 (1963) March 6.

HB25. "Cracking of Volatile Liquid Hydrocarbons to Carbon Monoxide and Hydrogen in Tapped-Gas Generators," A. Steinhofer, W. Knobloch and D. J. E. Kittel, (assigned to Badische Anilin- und Soda-Fabrik A.-G.), Ger. 1,146,998 (1963) April 11.

HB26. "Pyrolysis of Hydrocarbons," K. Buschmann, K. Eder and P. Schmulder, (assigned to Badische Anilin- und Soda Fabrik A.-G.), Belg. 636,818 (1964) March 2.

HB27. "Production of Hydrogen by the Partial Combustion of Hydrocarbons," K. Eder, P. Schmulder and W. Knobloch, (assigned to Badische Anilin- und Soda-Fabrik A.-G.), Belg. 660,871 (1965) September 10.

HB28. "Catalytic Cracking of C_{2-15} Hydrocarbons," H. Nonnenmacher and W. Rall, (assigned to Badische Anilin- und Soda-Fabrik A.-G.), Ger. 1,245,025 (1967) July 20.

HB29. "Production of Hydrogen and Carbon Monoxide," K. Buschmann, W. Knobloch, P. Schmulder and A. Schweitzer, (assigned to Badische Anilin- und Soda-Fabrik A.-G.), Fr. 1,501,233 (1967) November 10.

HB30. "Synthesis Gas," (assigned to Badische Anilin- und Soda-Fabrik A.-G.), Fr. 1,542,197 (1968) October 11.

HB31. "Catalytic Cracking of Hydrocarbons," (assigned to Badische Anilin- und Soda-Fabrik A.-G.), Fr. 1,544,524 (1968) October 31.

HB32. "Catalytic Dissociation of Hydrocarbons," (assigned to Badische Anilin- und Soda-Fabrik A.-G.), Fr. 1,548,421 (1968) December 6.

HB33. "Burner for the Partial Oxidation of Hydrocarbons for Synthesis Gas," A. Werner, K. Buschmann, H. Hauser and W. Knobloch, (assigned to Badische Anilin- und Soda-Fabrik A.-G.), Ger. Offen. 1,905,604 (1970) August 20.

HB34. "Hydrogen," (assigned to Bamag-Meguin A.-G.), Ger. 501,197 (1929) January 17.

HB35. "Equipment for Obtaining Gas With an Increased Hydrogen Content," M. M. Barshchevskii, E. S. Bezmozgin and M. M. Efros, U.S.S.R. 141,144 (1961) October 6.

HB36. "Nickel Catalysts for Obtaining Hydrogen and Carbon Dioxide From Hydrocarbons and Steam," (assigned to N.V. De Bataafsche Petroleum Maatschappij), Brit. 314,944 (1928) July 5.

HB37. "Hydrogen," (assigned to N. V. De Bataafsche Petroleum Maatschappij), Dutch 25,305 (1931) November 16.

HB38. "Hydrogen," (assigned to N. V. De Bataafsche Petroleum Maatschappij), Fr. 731,652 (1932) February 22.

HB39. "Hydrogen and Carbon Monoxide," (assigned to N. V. De Bataafsche Petroleum Maatschappij), Dutch 29,302 (1933) March 15.

HB40. "Cracking Methane," F. M. Pyzel, (assigned to N. V. De Bataafsche Petroleum Maatschappij), Brit. 391,532 (1933) May 4.

HB41. "Catalyst for Cracking Methane," (assigned to N. V. De Bataafsche Petroleum Maatschappij), Dutch 29,816 (1933) May 15.

HB42. "Hydrogen," J. Al (assigned to N. V. de Bataafsche Petroleum Maatschappij), U.S. 1,863,681 (1932) June 21.

HB43. "Hydrogen," (assigned to N. V. de Bataafsche Petroleum Maatschappij), Ger. 616,976 (1935) August 9.

HB44. "Carbon Monoxide," (assigned to N. V. de Bataafsche Petroleum Maatschappij), Brit. 637,776 (1950) May 24.

HB45. "Mixing and Bringing Into Reaction a Gaseous Hydrocarbon and an Oxygen-Containing Gas,", P. J. Schoenmakers and W. L. van de Putte, (assigned to N. V. de Bataafsche Petroleum Maatschappij), Dutch 71,499 (1952) December 15.

HB46. "Hydrogen-Carbon Monoxide Mixtures," M. J. Hofstede and J. A. Te Nuyl, (assigned to N. V. de Bataafsche Petroleum Maatschappij), Neth. 98,790 Appl. (1956) July 20.

HB47. "Gas Mixtures Containing Carbon Monoxide and Hydrogen," J. A. Te Nuyl, (assigned to N. V. de Bataafsche Petroleum Maatschappij), Brit. 780,120 (1957) July 31.

HB48. "Gas Mixtures Containing Hydrogen and Carbon Monoxide," (assigned to N. V. de Bataafsche Petroleum Maatschappij), Brit. 832,385 (1960) April 6.

HB49. "Gas Mixtures Containing Hydrogen and Carbon Monoxide," J. G. Goetzee and P. L. Klaasen, (assigned to N. V. de Bataafsche Petroleum Maatschappij), Brit. 835,815 (1960) May 25.

HB50. "Gas Mixtures Containing Hydrogen and Carbon Monoxide," (assigned to N. V. de Bataafsche Petroleum Maatschappij,), Brit. 850,409 (1960) October 5.

HB51. "Apparatus for Preparation of Mixtures of Hydrogen and Carbon Monoxide," (assigned to N. V. de Bataafsche Petroleum Maatschappij), Brit. 851,542 (1960) October 19.

HB52. "Hydrogen and Carbon From Decomposition of Methane," R. Battig, Brit. 271,483 (1926) May 20.

HB53. "Hydrogen and Carbon From Decomposition of Mehtane," R. Battig, Brit. 271,491 (1926) May 20.

HB54. "Hydrogen by Dissociation of Hydrocarbons," R. Battig, Fr. 635,670 (1927) May 18.

HB55. "Hydrogen," R. Battig, Brit. 294,113 (1927) July 16.

HB56. "Hydrogen," R. E. Battig, Can. 284,117 (1928) October 23.

HB57. "Preparation of Gas Mixtures Suitable for Synthesis Gas Preparation or for Cracking of Hydrocarbons by a Calcining Process," F. Baumann, Ger. 956,676 (1957) January 24.

HB58. "Two-Pressure Plant for Carbon Monoxide Conversion," F. Baumann, Ger. 1,076,633 (1960) March 3.

HB59. "C Black and H by Exothermal Decomposition of Hydrocarbons," R. Wendlandt and A. Dolde, (assigned to Bayerische Stickstoff-Werke A.-G.), Ger. 715,338 (1941) November 27.

HB60. "Hydrogen," J. Bellay, Brit. 284,262 (1927) January 26.

HB61. "Soda Lime for Use in Producing Pure Hydrogen," J. Bellay, U.S. 1,826,722 (1932) October 13.

HB62. "Production of an Ammonia Synthesis Gas," N. I. Belyaev, L. A. Saveleva and E. Y. Melnikov, U.S.S.R. 241,405 (1969) April 18.

HB63. "Hydrogen From Alkanes," E. Rindtorff, W. Ruschmann and G. Bracht, (assigned to Bergwerksgesellschaft Hibernia A.-G.), Ger. 944,545 (1956) June 21.

HB64. "Hydrogen From Methane or Gases Containing Methane," (assigned to Bergwerksgesellschaft Hibernia Akt.-Ges.), Brit. 754,710 (1956) August 8.

HB65. "Synthesis Gas," E. H. Berkhuijsen and H. W. J. Kempen, Brit. 898,338 (1962) June 6.

HB66. "Electric Decomposition of Hydrocarbon Oils to Produce Acetylene, Hydrogen, Etc." J. Bethenod, Brit. 316,905 (1928) April 4.

HB67. "Continuous Production of Technical Hydrogen," E. S. Bezmozgin, I. L. Glezin and V. N. Petrov, U.S.S.R. 174,174 (1965) August 28.

HB68. "Cracking hydrocarbons to Carbon and Hydrogen," C. F. Ramseyer, (assigned to H. A. Brassert and Co.), U.S. 2,389,636 (1945) November 27.

HB69. "Ammonia Synthesis Feed Gas," G. A. White, (assigned to F. Braun and Co.), U.S. 2,864,772 (1958) December 16.

HB70. "Synthesis of Ammonia," (assigned to C. F. Braun and Co.), Neth. Appl. 6,608,346 (1967) April 24.

HB71. "Apparatus for the Manufacture of Hydrogen and Carbon-Black From Hydrocarbons," R. H. Brownlee and R. H. Uhlinger, U.S. 1,265,043 (1918) May 7.

HB72. "Carbon-Black and Hydrogen From Hydrocarbons," R. H. Brownlee and R. H. Uhlinger, U.S. 1,276,487 (1918) August 20.

HC1. "Carbon Black and Synthesis Gas," C. A. Stokes, (assigned to Godfrey L. Cabot, Inc.), U.S. 2,672,401 (1954) March 16.

HC2. "Hydrogen," M. Casale, Fr. 635,946 (1927) June 14.

HC3. "Hydrogen From Carbon Monoxide by Use of Catalysts," M. Casale-Sacchi, Brit. 299,492 (1927) July 25.

HC4. "Hydrogen," M. Casale, Fr. 638,323 (1927) July 27.

HC5. "Hydrogen-Nitrogen Mixture," M. Casale-Sacchi, Can. 285,619 (1928) December 18.

HC6. "Carbon Monoxide and Hydrogen From Hydrocarbons," L. Casale, Brit. 274,610 (1926) June 2.

HC7. "Removal of Sulfur Compounds in Steam-Gas Reforming and Shift Conversion Processes," J. S. Cromeans, (assigned to Catalysts and Chemical Inc.), U.S. 3382044 (1968) May 7.

HC8. "Hydrogen by Steam-Methane Reforming," R. H. Habermehl and K. A. Atwood, (assigned to Catalysts and Chemical Inc.), U.S. 3382045 (1968) May 7.

HC9. "Hydrogen Production," R. H. Habermehl and K. A. Atwood, (assigned to Catalysts and Chemicals, Inc.), U.S. 3,387,942 (1968) June 11.

HC10. "Two-Stage Steam Reforming With Rapid Warm-Up in First Stage Using a Promoted Catalyst," R. E. Reitmeier, (assigned to Catalysts and Chemical, Inc.), U.S. 3,388,074 (1968) June 11.

HC11. "High-Temperature Gas-Reforming Apparatus," (assigned to Centre National de Recherches Metallurgiques), Belg. 770,094 (1972) January 17.

HC12. "Decomposition of Methane," M. Chaffette, Fr. 733,248 (1932) March 14.

HC13. "Decomposition of Methane," M. Chaffette, Fr. 734,032 (1932) March 23.

HC14. "Nickel Reforming Catalyst and Production," (assigned to Chemetron Corp.), Brit. 959,769 (1964) June 3.

HC15. "Catalysts for the Steam-Hydrocarbon Reaction," M. R. Arnold, (assigned to Chemetron Corp.), U.S. 3,256,207 (1966) June 14.

HC16. "Hydrogen and Carbon Black," R. S. Richardson, (assigned to Chemical Construction Corp.), U.S. 2,013,699 (1935) September 10.

HC17. "Multistage Catalytic Conversion, Especially of Carbon Monoxide and Water Vapor to Carbon Dioxide and Hydrogen," A. Christensen and G. R. James (assigned to Chemical Construction Corp.), U.S. 3,010, 807 Appl. (1958) September 10.

HC18. "Hydrocarbon Reform Process," G. R. James (assigned to Chemical Construction Corp.), U.S. 3,071,453 (1963) January 1.

HC19. "Catalytic Reforming With Steam," A. R. Bernas and G. R. James, (assigned to Chemical Construction Corp.), Belg. 624,622 (1963) May 9.

HC20. "Synthesis Gas From Naphtha," (assigned to Chemical Construction Corp.), Neth. Appl. 6,406,292 (1964) December 7.

HC21. "Hydrocarbon Reform Furnace," P. Korwin (assigned to Chemical Construction Corp.), U.S. 3,172,739 (1965) March 9.

HC22. "Synthesis Gas Producer," P. Korwin and G. R. James (assigned to Chemical Construction Corp.), U.S. 3,190,730 (1965) June 22.

HC23. "A Furnace for the Catalytic Steam Reforming of Gaseous Hydrocarbons," (assigned to Chemical Construction Corp.), Brit. 1,064,183 (1967) April 5.

HC24. "Hydrogen-Rich Synthesis Gases," S. Strelzoff, H. C. Morgenster and J. M. Connor, (assigned to Chemical Construction Corp.), Ger. Offen. 1,808,911 (1969) July 17.

HC25. "Synthesis Gas," S. J. Bongiorno, (assigned to Chemical Construction Corp.), U.S. Re-Issue 26,990 (1970) November 24.

HC26. "Catalytic Reactions; Cracking Hydrocarbons; Hydrogen," (assigned to Chemical Fuel Co. of America), Brit. 160,466 (1921) March 3.

HC27. "Unsaturated Hydrocarbon Gases by Cracking Liquid Hydrocarbons in the Electric Arc, (assigned to Chemische Werke Huls Akt.-Ges.), Brit. 804,090 (1958) November 5.

HC28. "Thermal Cracking of Liquid Hydrocarbons," (assigned to Chemische Werke Huls Akt.-Ges.), Brit. 824,622 (1959) December 2.

HC29. "Dihydrocyclodimerization of Low-Molecular-Weight Paraffins," S. M. Csicsery, (assigned to Chevron Research Co.), U.S. 3,296,324 (1967) January 3.

HC30. "Hydrogen Manufacture Using Centrifugal Compressors," C. S. Smith and W. J. McLeod, (assigned to Chevron Research Co.), Brit. 1,192,288 (1970) May 20.

HC31. "Petroleum Refining Utilizing Hydrogen Produced From a Portion of the Feed," C. S. Smith, (assigned to Chevron Research Co.), U.S. 3,537,977 (1970) November 3.

HC32. "Hydrogen Manufacture Using Gas Turbine-Driven Centrifugal Compressors," C. S. Smith and W. J. McLeod, (assigned to Chevron Research Co.), U.S. 3,576,603 (1971) April 27.

HC33. "High-Pressure Hydrogen Manufacture," C. S. Smith and W. J. McLeod, (assigned to Chevron Research Co.), Brit. 1,247,428 (1971) September 22.

HC34. "Hydrogen," G. Cicall, Fr. 35,525 (1928) May 22.

HC35. "Recovery of Light Hydrocarbons From Mixtures Such as Natural Gas or Pressure Distillates From Petroleum Cracking," D. G. Brandt, (assigned to Cities Service Oil Co.), U.S. 2,355,589 (1944) August 8.

HC36. "Hydrogen From Hydrocarbons," J. C. Clancy, Can. 215,384 (1922) January 24.

HC37. "Apparatus for Producing H and C by Thermal and Catalytic Treatment of Hydrocarbon Vapors," W. G. Clark, (assigned to Clarkiron, Inc.), U.S. 2,367,928 (1945) January 23.

HC38. "Apparatus for Generating Gases, Such as CO and H, From Natural Gas and Air," H. L. Griswold, (assigned to Coast Reduction, Inc.), U.S. 2,338,506 (1944) January 4.

HC39. "Self-Supporting Catalytic Reaction for the Decomposition of Hydrocarbons and Their Derivatives Into the Elements," R. Collalto, Ital. 551,086 (1956) November 15.

HC40. "Mixtures of Nitrogen and Hydrogen for Ammonia Synthesis From Methane," M. Colombo, Ital. 538,597 (1956) January 26.

HC41. "Combustible Gas," W. W. Odell, (assigned to Columbia Engineering and Management Corp.), U.S. 1,762,100 (1930) June 3.

HC42. "Mixtures of Carbon Monoxide and Hydrogen in Controlled Proportions," S. P. Burke, (assigned to Combustion Utilities Corp.), U.S. 1,843,063 (1932) Juanuary 26.

HC43. "Reforming of Hydrocarbons," L. A. Stengel, (assigned to Commercial Solvents Corp.), U.S. 2,852,358 (1958) September 16.

HC44. "Reforming Hydrocarbons for the Production of Ammonia Synthesis Gas," R. Bidard and R. Pietraru, (assigned to Compagnie Electro-Mecanique), Ger. Offen. 1,964,916 (1970) July 2.

HC45. "Hydrogen," (assigned to Compagnie Nationale De Matieres Colorantes Et Manufactures De Produits Chimiques Du Nord Reunifs), Brit. 286,291 (1927) March 3.

HC46. "Hydrogen, (assigned to Compagnie De Produits Chim. Et Electrometallurgiques Alais, Froges Et Camargus), Fr. 683,909 (1929) October 25.

HC47. "Carbon Black," K. Baum, (assigned to Compagnie Pan-Europeenne d installations et d equipment industrials S.a.r.l.), Fr. 1,026,961 (1953) May 6.

HC48. "Production of a Mixture of Hydrogen and Steam," (assigned to Con-Gas Service Corp.), Neth. Appl. 6,506,948 (1965) December 2.

HC49. "Hydrogen From Natural Gas," (assigned to Con-Gas Service Corp.), Neth. Appl. 6,515,214 (1966) May 26.

HC50. "Reforming of Natural Gas," A. J. W. Ploum and H. H. Tafreshi, (assigned to Conch International Methane, Ltd.), Brit. 918,345 (1963) February 13.

HC51. "Hydrogen and Nitrogen," J. I. Bronn, (assigned to Concordia Bergbau A.-G.), Fr. 700,600 (1930) August 13.

HC52. "Gas Reformer and Temperature Control Apparatus," H. R. Linden, B. S. Baker, J. Meek and A. C. Allen, (assigned to Consolidated Natural Gas Service Co., Inc.), U.S. 3,428,759 (1969) April 15.

HC53. "Hydrogen Production Via the Steam-Iron Process," J. Huebler, J. L. Johnson, F. C. Schora, Jr. and P. B. Tarman, (assigned to Consolidation Coal Co.), U.S. 3,442,620 (1969) May 6.

HC54. "Production of Hydrogen Via the Steam-Iron Process Utilizing Dual Solids Recycle," J. Huebler, J. L. Johnson, F. C. Schora, Jr. and P. B. Tarman, (assigned to Consolidation Coal Co.), U.S. 3,442,619 (1969) May 6.

HC55. "Pyrolysis of Hydrocarbon Feeds," H. W. Cooper, U.S. 3,711,568 (1973) January 16.

HC56. "Gases Containing Acetylene, Ethylene, Carbon Monoxide, and Hydrogen," J. R. Arthur and d. H. Napier, (assigned to C.U.R.A. Patents Ltd.), Brit. 831,115 (1960) March 23.

HD1. "Gas Mixture for the Production of Methanol," F. W. De Jahn, U.S. 2,383,715 (1945) August 28.

HD2. "Apparatus for Electrolytic Decomposition of Water," H. Petschar, (assigned to Demag-Elektrometallurgie G.m.b.H.), Ger. 954,956 (1956) December 27.

HD3. "Hydrogen," R. and J. Dempster and R. Dempster, Brit. 104,115 (1916) August 12.

HD4. "Gas Manufacture; Hydrogen, R. and H. Dempster, H. S. Knight and F. J. Siddall, Brit. 169,539 (1920) July 3.

HD5. "Hydrogen," R. Kurtz and Dr. I. P. Schwarzkopf, (assigned to Deutsche Gluhfadenfabrik), Brit. 166,541 (1921) July 13.

HD6. "Gas Mixture Suitable for the Synthesis of NH_3," (assigned to Deutsche Gold- und Silber-Scheideanstalt vorm. Roessler), Belg. 447,237 (1942) October 31.

HD7. "Cleavage of Liquid Hydrocarbons by the Electric Arc," H. Kroepelin, (assigned to Deutsche Gold- und Silber-Scheideanstalt vorm. Roessler), Ger. 960,657 (1957) March 28.

HD8. "Distilling or Gasifying Fuels," (assigned to Didier-Werke A.-G.), Brit. 499,018 (1939) January 17.

HD9. "Hydrogen and Hydrogen-Containing Gases From Methane or Other Hydrocarbons," Z. de Galocsy, Jr., (assigned to Didier-Werke A.-G.), Ger. 974,763 Appl. (1950) December 23.

HD10. "Synthesis Gas Free of Hydrocarbons," W. Terbeck, (assigned to Didier-Werke A.-G.), Ger. 975,039 Appl. (1953) April 10.

HD11. "Conversion of Liquid Hydrocarbons to Gases," O. Hemmann, (assigned to Didier-Werke Akt.-Ges.), Ger. 1,001,801 (1957) January 31.

HD12. "Hydrogen-Containing Gas Mixtures," W. Terbeck, (assigned to Didier-Werke Akt.-Ges.), Ger. 1,013,266 (1957) August 8.

HD13. "Fuel Gas," W. Terbeck, (assigned to Didier-Werke Akt.-Ges.), Ger. 1,035,309 (1958) July 31.

HD14. "Synthesis Gases," O. Hemmann, (assigned to Didier-Werke Akt.-Ges.), Ger. 1,038,013 (1958) September 4.

HD15. "Thermal Preparation of Hydrocarbon-Free Synthesis Gas From Gaseous or Liquid Hydrocarbons," W. Terbeck, (assigned to Didier-Werke Akt.-Ges.), Ger. 1,096,880 (1961) January 12.

HD16. "Hydrogen and Carbon Dioxide Mixtures," (assigned to Directie van de Staatsmijnen in Limburg), Brit. 703,441 (1954) February 3.

HD17. "Hydrogen-Nitrogen Mixtures," L. C. Updegraff, (assigned to Dominion Oxygen Co., Ltd.), Can. 384,432 (1939) October 3.

HD18. "Carbon Monoxide; Hydrogen," R. Drawe, Ger. 540,316 (1927) June 14.

HD19. "Hydrogen," J. S. Beekley, (assigned to DuPont Ammonia Corp.), U.S. 1,756,934 (1930) May 6.

HD20. "Hydrogen," R. Williams (assigned to DuPont Ammonia Corp.), U.S. 1,736,065 (1930) November 19.

HD21. "Hydrogen," A. T. Larson, (assigned to DuPont Ammonia Corp.), U.S. 1,797,426 (1931) March 24.

HD22. "Hydrogen," J. S. Beekley, (assigned to DuPont Ammonia Corp.), U.S. 1,799,452 (1931) April 7.

HD23. "Hydrogen by Catalysis of Steam and Hydrocarbons," R. Williams, (assigned to DuPont Ammonia Corp.), U.S. 1,826,974 (1932) October 13.

HD24. "Hydrogen," R. Williams, (assigned to DuPont Ammonia Corp.), U.S. 1,830,010 (1932) November 3.

HD25. "Hydrogen," R. Williams, (assigned to DuPont Ammonia Corp.), U.S. 1,834,115 (1932) December 1.

HD26. "Hydrogen," W. A. Dew, (assigned to DuPont Ammonia Corp.), U.S. 1,837,254 (1932) December 22.

HD27. "Apparatus for Producing Nitrogen and Hydrogen by Cracking Ammonia in the Presence of a Catalyst Such as Iron and Oxides of Magnesium and Aluminum," G. W. Burke, (assigned to E. I. du Pont de Nemours and Co.), U.S. 1,915,120 (1933) June 20.

HD28. "Hydrogen From Reaction of Hydrocarbons With Steam," J. S. Beekley, (assigned to E. I. du Pont de Nemours and Co.), U.S. 1,923,656 (1933) August 22.

HD29. "Hydrogen From Steam and Gaseous Hydrocarbons," J. S. Beekley, (assigned to E. I. duPont de Nemours and Co.), U.S. 1,889,530 (1933) November 29.

HD30. "Reaction of Steam With Hydrocarbons Such as Methane for the Production of Hydrogen," J. S. Beekley, (assigned to E. I. du Pont de Nemours and Co.), U.S. 1,959,151 (1934) May 15.

HD31. "Catalytic Production of Hydrogen From Steam and Hydrocarbon Material Such as Methane," J. C. Woodhouse, (assigned to E. I. du Pont de Nemours and Co.), U.S. 1,959,189 (1934) May 15.

HD32. "Hydrogen From Steam and Methane," J. C. Woodhouse, (assigned to E. I. Du Pont de Nemours and Co.), U.S. 1,960,886 (1934) May 29.

HD33. "Hydrogen From Steam and Hydrocarbons Such as Methane," A. T. Larson, (assigned to E. I. du Pont de Nemours and Co.), U.S. 1,960,912 (1934) May 29.

HD34. "Hydrogen," J. C. Woodhouse, (assigned to E. I. du Pont de Nemours and Co.), U.S. 1,968,063 (1934) July 31.

HD35. "Hydrogen Production," R. Williams, (assigned to E. I. du Pont de Nemours and Co.), U.S. 1,938,202 (1934) December 5.

HD36. "Mixture of Nitrogen and Hydrogen Formed by Cracking Ammonia," G. W. Burke, (assigned to E. I. du Pont de Nemours and Co.), U.S. 1,988,781 (1935) January 22.

HD37. "Hydrogen From Hydrocarbons and Steam," J. C. Woodhouse, (assigned to E. I. du Pont de Nemours and Co.), U.S. 2,064,867 (1937) December 22.

HD38. "Hydrogen From Steam and Hydrocarbons," R. Williams, (assigned to E. I. du Pont de Nemours and Co.), U.S. 2,119,565 (1938) June 7.

HD39. "Ammonia Synthesis Gas," R. V. Green, (assigned to E. I. du Pont de Nemours and Co.), U.S. 3,584,998 (1971) June 15.

HE1. "Production of Hydrogen," G. D. Bagley, W. B. Hendrik and W. Erasmus, (assigned to Electric Metallurgical Co. of Canada Ltd.), Can. 361,530 (1936) November 3.

HE2. "Producing Nitrogen and Hydrogen for Ammonia Synthesis," C. Ellis, U.S. 1,327,029 (1920) January 6.

HE3. "Apparatus for Electrolytic Production of Hydrogen and Oxygen From Water," P. A. Emanuel, U.S. 1,263,314 (1918).

HE4. "Apparatus for the Preparation of Hydrogen," W. C. Pfefferle, (assigned to Englehard Industries, Inc.), Fr. 1,383,782 (1965) January 1.

HE5. "Portable Hydrogen Generator," R. B. Green, H. H. Geissler and S. S. Kurpit, (assigned to Engelhard Industries, Inc.), Fr. 1,428,690 (1966) February 18.

HE6. "Hydrogen Generator," R. B. Green, H. H. Geissler and S. S. Kurpit, (assigned to Engelhard Minerals and Chemicals Corp.), U.S. 3,350,176 (1967) October 31.

HE7. "Steam Reforming With Prelimenary Hydrodesulfurization," G. E. J. Cohn and W. C. Pfefferle, (assigned to Engelhard Minerals and Chemicals Corp.), U.S. 3,595,805 (1971) July 27.

HE8. "Gasoline-Forming Hydrocarbons Boiling in a Temperature Range Lower Than the Charge," (assigned to Engelhard Minerals and Chemicals Corp.), Fr. Demande 2,128,150 (1972) November 24.

HE9. "Synthesis Gas," W. A. Herbst, (assigned to Esso Research and Engineering Co.), U.S. 2,690,963 (1954) October 5.

HE10. "Synthesis Gas," R. M. Hill and C. S. Lynch, (assigned to Esso Research and Engineering Co.), U.S. 2,709,645 (1955) May 31.

HE11. "Gas Manufacture," E. R. Retailliau, (assigned to Esso Research and Engineering Co.), U.S. 2,748,179 (1956) May 29.

HE12. "Gas Mixtures Containing Carbon Monoxide and Hydrogen," H. Z. Martin and F. T. Barr, (assigned to Esso Research and Engineering Co.), U.S. 2,765,222 (1956) October 2.

HE13. "Hydrogen and Coke From Hydrocarbon Gases," R. W. Krebs, (assigned to Esso Research and Engineering Co.), U.S. 2,805,177 (1957) September 3.

HE14. "Hydrogen From Methane," (assigned to Esso Research and Engineering Co.), Brit. 801,671 (1958) September 17.

HE15. "Hydrogen and Carbon Black," F. J. Buchmann and C. N. Kimberlin, Jr., (assigned to Esso Research and Engineering Co.), U.S. 2,885,267 (1959) May 5.

HE16. "Handling of Hot Gases, Carbon Monoxide and Hydrogen," N. P. Peet, (assigned to Esso Research and Engineering Co.), U.S. 3,014,787 Appl. (1959) June 8.

HE17. "Hydrogen Manufacture From Hydrocarbons," P. S. Viles, (assigned to Esso Research and Engineering Co.), U.S. 2,911,288 (1959) November 3.

HE18. "Manufacture of High-Purity Hydrogen From Naphtha-Hydroforming Gases," J. Weikart and R. C. Morbeck, (assigned to Esso Research and Engineering Co.), U.S. 2,913,401 (1959) November 17.

HE19. "Synthesis Gas," N. P. Peet, (assigned to Esso Research and Engineering Co.), U.S. 2,946,754 (1960) July 26.

HE20. "Hydrogen," (assigned to Esso Research and Engineering Co.), Brit. 857,587 (1961) January 4.

HE21. "Hydrogen," W. F. Arey, Jr., (assigned to Esso Research and Engineering Co.), U.S. 2,985,512 (1961) May 23.

HE22. "Hydrogen by the Steam-Iron Reaction," (assigned to Esso Research and Engineering Co.), Brit. 902,338 (1962) August 1.

HE23. "Fuel Gas From Solid Fuels," D. A. C. Dewdney and W. G. Lowenstein-Lom, (assigned to Esso Research and Engineering Co.), Brit. 927,810 (1963) June 6.

HE24. "Preparation of Hydrogen by Steam Reforming of Hydrocarbons," C. E. Jahnig, (assigned to Esso Research and Engineering Co.), U.S. 3,147,080 (1964) September 1.

HE25. "Hydrocarbon Conversion Process," C. E. Jahnig, P. L. Silveston and C. W. Tyson, (assigned to Esso Research and Engineering Co.), U.S. 3,163,496 (1964) December 29.

HE26. "Conversion of Hydrocarbons to Hydrogen and Carbon Monoxide," K. H. Moritz, J. F. Moser, Jr. and E. J. Estropinal, Jr., (assigned to Esso Research and Engineering Co.), U.S. 3,168,386 (1965) February 2.

HE27. "Hydrogen Production From Fluidized-Bed Coking of Residual Oils," G. P. Hammer, K. H. Moritz and W. J. Metrailer, (assigned to Esso Research and Engineering Co.), U.S. 3,179,584 (1965) April 20.

HE28. "Gas Mixtures for Endothermic Reduction of Fine Ore," N. P. Peet, (assigned to Esso Research and Engineering Co.), U.S. 3,193,378 (1965) July 6.

HE29. "Production of Hydrogen and Coke," W. E. Meiers and W. T. Andreas, (assigned to Esso Research and Engineering Co.), U.S. 3,254,957 (1966) June 7.

HE30. "Catalytic Conversion of Hydrocarbons to Hydrogen at Low Temperature and High Pressure," W. F. Taylor, F. S. Pramuk and B. N. Heimlich, (assigned to Esso Research and Engineering Co.), Fr. 1,443,096 (1966) June 24.

HE31. "Process for Separating Gaseous Components From Gaseous Mixtures," (assigned to Esso Research and Engineering Co.), Neth. App. 6,602,141 (1966) August 22.

HE32. "Production of Hydrogen," W. F. Taylor, (assigned to Esso Research and Engineering Co.), Fr. 1,452,728 (1966) September 16.

HE33. "Electrode Installation in Cracking Reactors," B. V. Molstedt, R. O. Maak and L. J. Delaune, (assigned to Esso Research and Engineering Co.), U.S. 3,305,619 (1967) February 21.

HE34. "Electro-Fluid Reactor for High-Temperature Gasification Process," J. Bernstein, (assigned to Esso Research and Engineering Co.), U.S. 3,314,767 (1967) April 18.

HE35. "Continuous Two-Stage Production of Highly Pure Hydrogen and a Carbon Monoxide- and Hydrogen-Rich Gas," W. K. Lewis, (assigned to Esso Research and Engineering Co.), Ger. 1,242,193 (1967) June 15.

HE36. "Electrode Assembly for Fluidized Bed Reactors," B. V. Molstedt, R. O. Maak and L. J. Delaune, (assigned to Esso Research and Engineering Co.), Fr. 1,507,739 (1967) December 29.

HE37. "Uniform Flow of Fluidized Coke to the Reheating Zone During Hydrogen Generation by Coking," M. E. Oldweiler, (assigned to Esso Research and Engineering Co.), Fr. 1,533,265 (1968) July 19.

HE38. "Reducing Gases," F. J. Heinzelmann and A. L. Saxton, (assigned to Esso Research and Engineering Co.), Brit. 1,149,799 (1969) April 23.

HE39. "Hydrogen-Rich Gases," (assigned to Esso Research and Engineering Co.), Fr. 1,565,873 (1969) May 2.

HE40. "Selective Conversion of Naphtha Hydrocarbons to Hydrogen," W. F. Taylor and J. H. Sinfelt, (assigned to Esso Research and Engineering Co.), Brit. 1,156,766 (1969) July 2.

HE41. "Fluidized-Bed Coking of Hydrocarbons," C. N. Kimberlin, Jr., H. G. Ellert and M. E. Oldweiler, (assigned to Esso Research and Engineering Co.), U.S. 3,459,655 (1969) August 5.

HE42. "Hydrogen," W. F. Taylor, (assigned to Esso Research and Engineering Co.), U.S. 3,508,873 (1970) April 28.

HE43. "Hydrogen From Petroleum Coke," R. R. Johnson and C. N. Kimberlin, Jr., (assigned to Esso Research and Engineering Co.), U.S. 3,542,532 (1970) November 24.

HE44. "Hydrogen Manufacture," C. L. Aldridge and T. Kalina, (assigned to Esso Research and Engineering Co.), Ger. Offen. 2,054,869 (1971) May 19.

HE45. "Hydrogen Production From an Integrated Coker Gasifier System," C. N. Kimberlin, Jr. and G. P. Hammer, (assigned to Esso Research and Engineering Co.), U.S. 3,726,791 (1973) April 10.

HE46. "Cracking of Hydrocarbons," R. P. Chan and D. J. Angier, (assigned to Esso Research and Engineering Co.), Ger. Offen. 2,156,963 (1973) May 24.

HF1. "Acetylene and Hydrogen From the Electric Arc," O. Fisenhut, (assigned to I. G. Farbenind. A.-G.), Ger. 540,897 (1926) February 3.

HF2. "Hydrogen," (assigned to I. G. Farbenind, A.-G.), Brit. 267,535 (1926) March 10.

HF3. "Unsaturated Hydrocarbons and Hydrogen," (assigned to I. G. Farbenind. A.-G.), Brit. 269,547 (1926) April 15.

HF4. "Carbon Monoxide and Hydrogen From Hydrocarbons," G. Wietzel, A. Starke and O. Eisenhut, (assigned to I. G. Farbenind. A.-G.), Ger. 488,502 (1926) April 16.

HF5. "Hydrogen; Hydrogen-Nitrogen Mixtures," G. Wietzel, W. Haller and W. Hennicke, (assigned to I. G. Farbenind. A.-G.), Ger. 558,430 (1926) June 27.

HF6. "Hydrogen," O. Schmidt and G. Niemann, (assigned to I. G. Farbenind. A.-G.), Ger. 546,205 (1926) August 1.

HF7. "Hydrogen," (assigned to I. G. Farbenind. A.-G.), Brit. 288,662 (1926) November 15.

HF8. "Hydrogen," (assigned to I. G. Farbenind. A.-G.), Brit. 288,056 (1926) December 30.

HF9. "Hydrogen," (assigned to I. G. Farbenind. A.-G.), Swiss 127,0340 (1927) March 8.

HF10. "Unsaturated Hydrocarbons and Hydrogen," (assigned to I. G. Farbenind. A.-G.), Fr. 634,210 (1927) March 28.

HF11. "Hydrogen From Methane," (assigned to I. G. Farbenind. A.-G.), Fr. 632,861 (1927) April 15.

HF12. "Hydrogen From Methane Hydrocarbons and Steam," (assigned to I. G. Farbenind. A.-G.), Brit. 291,244 (1927) June 18.

HF13. "Catalytic Production of Hydrogen," (assigned to I. G. Farbenind. A.-G.), Brit. 301,969 (1927) September 15.

HF14. "Hydrogen From Mixed Gases," (assigned to I. G. Farbenind. A.-G.), Brit. 299,167 (1927) September 2.

HF15. "Hydrogen and Carbon Monoxide," (assigned to I. G. Farbenind. A.-G.), Fr. 649,298 (1927) November 14.

HF16. "Hydrogen and Carbon Monoxide," (assigned to I. G. Farbenind. A.-G.), Fr. 644,147 (1927) November 18.

HF17. "Hydrogen," (assigned to I. G. Farbenind. A.-G.), Brit. 319,957 (1928) October 18.

HF18. "Hydrogen and Phosphoric Acid," (assigned to I. G. Farbenind. A.-G.), Brit. 324,122 (1928) October 28.

HF19. "Hydrogen by Catalytic Decomposition of Hydrocarbons," (assigned to I. G. Farbenind. A.-G.), Brit. 323,855 (1928) November 8.

HF20. "Hydrogen From Water Gas and Other Reactions," (assigned to I. G. Farbenind. A.-G.), Brit. 324,158 (1928) November 19.

HF21. "Hydrogen," (assigned to I. G. Farbenind. A.-G.), Brit. 322,701 (1929) February 22.

HF22. "Production of Lamp Black, Acetylene and Hydrogen," O. Eisenhut, (assigned to I. G. Farbenind. A.-G.), Ger. 523,627 (1929) March 10.

HF23. "Hydrogen and Carbon Monoxide From Methane," (assigned to I. G. Farbenind. A.-G.), Brit. 336,635 (1929) April 8.

HF24. "Hydrogen and Carbon Monoxide From Methane," (assigned to I. G. Farbenind. A.-G.), Brit. 336,944 (1929) April 8.

HF25. "Hydrogen From Methane," (assigned to I. G. Farbenind. A.-G.), Fr. 672,935 (1929) April 11.

HF26. "Apparatus for Endothermic Catalytic Reactions," (assigned to I. G. Farbenind. A.-G.), Brit. 327,025 (1929) April 15.

HF27. "Thermal Decomposition of Methane," (assigned to I. G. Farbenind. A.-G.), Brit. 336,261 (1929) July 10.

HF28. "Acetylene and Hydrogen From Methane by Electric Arc Treatment," (assigned to I. G. Farbenind. A.-G.), Brit. 332,057 (1929) July 12.

HF29. "Hydrogen and Oxyacids of Phosphorus," (assigned to I. G. Farbenind. A.-G.), Brit. 337,109 (1929) August 24.

HF30. "Hydrogen and Carbon Monoxide From Methane," E. Wilke and F. Fried, (assigned to I. G. Farbenind. A.-G.), Ger. 525,556 (1929) September 12.

HF31. "Graphite and Hydrogen," H. Bahr, (assigned to I. G. Farbenind. A.-G.), Ger. 516,991 (1929) October 4.

HF32. "Carbon Black and Hydrogen," (assigned to I. G. Farbenind. A.-G.), Brit. 346,680 (1929) October 12.

HF33. "Hydrogen From Hydrocarbons," (assigned to I. G. Farbenind. A.-G.), Brit. 349,060 (1929) November 18.

HF34. "Hydrogen," (assigned to I. G. Farbenind. A.-G.), Fr. 685,854 (1929) November 30.

HF35. "Acetylene and Hydrogen From Methane by Electric-Arc Treatment," (assigned to I. G. Farbenind. A.-G.), Fr. 687,884 (1930) January 9.

HF36. "Lampblack, Acetylene and Hydrogen," (assigned to I. G. Farbenind. A.-G.), Fr. 690,869 (1930) March 1.

HF37. "Use of Alkali Metal or Alkaline Earth Metal Vapors in Promoting Gas Reactions," (assigned to I. G. Farbenind. A.-G.), Brit. 353,622 (1930) June 6.

HF38. "Carbon Monoxide and Hydrogen," (assigned to I. G. Farbenind. A.-G.), Fr. 701,003 (1930) August 23.

HF39. "Hydrocarbons," (assigned to I. G. Farbenind. A.-G.), Brit. 366,107 (1930) September 26.

HF40. "Hydrogen-Nitrogen Mixtures From Bituminous Fuels," (assigned to I. G. Farbenind. A.-G.), Brit. 360,750 (1931) January 21.

HF41. "Hydrogen," (assigned to I. G. Farbenind. A.-G.), Fr. 710,626 (1931) February 5.

HF42. "Acetylene and Hydrogen Production in the Electric Arc," O. Eisenhut, (assigned to I. G. Farbenind. A.-G.), U.S. 1,794,004 (1931) February 24.

HF43. "Hydrogen," (assigned to I. G. Farbenind. A.-G.), Fr. 729,119 (1931) December 31.

HF44. "Hydrogen," (assigned to I. G. Farbenind. A.-G.), Fr. 729,429 (1932) Juanuary 9.

HF45. "Hydrogen," (assigned to I. G. Farbenind. A.-G.), Fr. 740,663 (1932) August 2.

HF46. "Unsaturated Gaseous Hydrocarbons and Hydrogen From Saturated Hydrocarbons," G. Wietzel and A. Starke, (assigned to I. G. Farbenind. A.-G.), U.S. 1,892,973 (1933) January 3.

HF47. "Apparatus for Endothermic Catalytic Reactions Such as Hydrogen and Carbon Monoxide Production frm Methane and Steam," G. Wietzel and G. Schiller, (assigned to I. G. Farbenind. A.-G.), U.S. 1,894,140 (1933) January 10.

HF48. "Hydrogen and Nitrogen From Bituminous Fuels," C. Schneider and H. Buetefisch, (assigned to I. G. Farbenind. A.-G.), U.S. 1,898,967 (1933) February 21.

HF49. "Hydrogen," (assigned to I. G. Farbenind. A.-G.), Fr. 742,842 (1933) March 17.

HF50. "Acetylene and Hydrogen," O. Eisenhut, (assigned to I. G. Farbenind. A.-G.), U.S. 1,904,426 (1933) April 18.

HF51. "Hydrogen by Reaction of Steam With Methane," G. Wietzel and G. Schiller, (assigned to I. G. Farbenind. A.-G.), U.S. 1,921,856 (1933) August 8.

HF52. "Carbon Black, Hydrogen and Acetylene From Methane," O. Eisenhut, (assigned to I. G. Farbenind. A.-G.), U.S. 1,880,924 (1933) October 4.

HF53. "Separating Mixed Gases Such as Hydrogen and Nitrogen," P. Gamelin and A. Knodel, (assigned to I. G. Farbenind. A.-G.), U.S. 1,881,490 (1933) October 11.

HF54. "Hydrogen From Gaseous Aliphatic Hydrocarbons Such as Methane," O. Schmidt and G. Niemann, (assigned to I. G. Farbenind. A.-G.), U.S. 1,882,977 (1933) October 18.

HF55. "Hydrogen From Hydrocarbons," G. Wietzel, W. Haller and W. Hennicke, (assigned to I. G. Farbenind. A.-G.), U.S. 1,957,743 (1934) May 8.

HF56. "Hydrogen From Methane," W. Hennicke, (assigned to I. G. Farbenind. A.-G.), U.S. 1,931,492 (1934) October 24.

HF57. "Hydrogen Production by Catalytic Conversion of Hydrocarbons by Steam," G. Wietzel and W. Hennicke, (assigned to I. G. Ferbenind. A.-G.), U.S. 1,934,836 (1934) November 14.

HF58. "Hydrogen," (assigned to I. G. Farbenind. A.-G.), Ger. 606,841 (1934) December 12.

HF59. "Carbon Monoxide and Hydrogen From Methane," E. Wilke and F. Fried, (assigned to I. G. Farbenind. A.-G.), U.S. 2,042,285 (1936) May 26.

HF60. "Hydrogen," (assigned to I. G. Farbenind. A.-G.), Fr. 801,380 (1936) August 3.

HF61. "Hydrogen From Hydrocarbons," G. Schiller and G. Wietzel, (assigned to I. G. Farbenind, A.-G.), U.S. 2,056,911 (1936) October 6.

HF62. "Hydrogen," (assigned to I. G. Farbenind. A.-G.), Brit. 458,692 (1936) December 24.

HF63. "Hydrogen Production From Gaseous Hydrocarbons Such as Methane," G. Schiller and G. Wietzel, (assigned to I. G. Farbenind. A.-G.), U.S. 2,083,795 (1937) June 15.

HF64. "Hydrogen-Carbon Monoxide Mixtures," E. Sachsse and E. Bartholome, (assigned to I. G. Farbenind. A.-G.), Ger. 739,445 (1943) August 12.

HF65. "Acetylene, Ethylene, and Synthesis Gas From Gaseous or Liquid Hydrocarbons," G. Fauser, Ital. 590,169 (1959) March 25.

HF66. "Absorption of Hydrogen," E. Feigelson, Fr. 707,561 (1930) October 6.

HF67. "Decreasing the Content of Carbon Monoxide and (or) Carbon Dioxide of Fuel Gases," J. Sellin, (assigned to Firma August Klonne), Ger. 1,080,727 (1960) April 28.

HF68. "Synthesis Gas Generation," M. J. P. Bogart, (assigned to Fluor Corp.), U.S. 3,743,488 (1973) July 3.

HF69. "Hydrogen From Hydrocarbon Gases and Steam," (assigned to Foster Wheeler Ltd.), Brit. 782,462 (1957) September 4.

HF70. "Producing Hydrogen-Containing Gases From Hydrocarbons," A. C. Faatz, Jr., (assigned to Foster Wheeler Corp.), U.S. 2,813,779 (1957) November 19.

HF71. "Integral-Tube Furnace and Oxidizer for Reforming Hydrocarbons," F. M. Pyzel, (assigned to Foster Wheeler Corp.), U.S. 3,195,989 (1965) July 20.

HF72. "Steam Reforming of Light Hydrocarbon Feeds," (assigned to Foster Wheeler Corp.), Brit. 1,059,957 (1967) February 22.

HF73. "Catalyst for the Conversion of Hydrocarbons to a Mixture of Carbon Monoxide and Hydrogen," (assigned to Bedrich Fottr-Smolik), Czech. 98,414 (1961) February 15.

HF74. "Electrolytic Hydrogen and Oxygen Generator," C. H. Frazer, U.S. 1,262,034 (1918) April 9.

HF75. "Combustion Chamber for the Thermal Decomposition of Hydrocarbons," R. P. Frazer, Brit. 827,719 (1960) February 10.

HF76. "Simultaneous Production of Acetylene and Synthesis Gas by Incomplete Combustion of Hydrocarbon Gases," M. Freund, P. Benedek, A. Laszlo and A. Nemeth, Hung. 147, 610 (1960) October 15.

HF77. "Apparatus for the Electrolysis of Water," G. Fuchs and H. Spath, Fr. 716,782 (1931) May 8.

HG1. "Thermal and Thermocatalytic Cracking of Hydrocarbons With Different Temperatures of Cleavage," F. Gagas, S. Kratky, A. Lazarev and M. Stand, Czech. 90,712 (1959) June 15.

HG2. "Industrial Gas From Tar-Containing Heavy Oils," Z. de Galocsy, Ger. 1,008,862 (1957) May 23.

HG3. "Heating and Reforming Hydrocarbons and Other Gases," J. D. Madaras, (assigned to Gas Inc.), U.S. 2,971,752 (1961) February 14.

HG4. "Gas From Oil-Containing Hydrocarbons," F. J. Dent and F. C. Wood, (assigned to Gas Council), Ger. 1,021,122 (1957) December 19.

HG5. "Gases Rich in Hydrogen," F. J. Dent, (assigned to Gas Council), Brit. 895,038 (1962) April 26.

HG6. "Reforming Hydrocarbons," M. MacCormac, (assigned to Gas Council), Brit. 969,528 (1964) September 9.

HG7. "Reactor for Making Carbon Monoxide and Hydrogen From Methane," R. G. Cockerham, R. F. Edge, S. T. Loh and G. Percival, (assigned to Gas Council), Brit. 1,020,014 (1966) February 16.

HG8. "Steam-Reforming of Methane-Rich Gases," G. Percival, (assigned to Gas Council), Brit. 1,039,756 (1966) August 24.

HG9. "Production of Hydrogen-Rich Gases," D. Hebden and K. J. Humphries, (assigned to Gas Council), Brit. 1,063,464 (1967) March 30.

HG10. "Conversion of Methane to Carbon Monoxide and Hydrogen," G. Percival, (assigned to Gas Council), Brit. 1,098,722 (1968) January 10.

HG11. "Catalytic Reforming of Hydrocarbons in the Presence of Steam," (assigned to Gas Council), Fr. 1,529,097 (1968) June 14.

HG12. "Hydrogen," (assigned to Gasverarbeitungs Ges.), Brit. 294,580 (1927) July 26.

HG13. "Hydrogen Production," H. H. Breault, (assigned to General Electric Co.), U.S. 3,116,116 (1963) December 31.

HG14. "Fuel-Cell Design Based on Air and Reformable Fuel," (assigned to General Electric Co.), Brit. 1,174,973 (1969) December 17.

HG15. "Compact Reactor-Boiler Combination for Converting a Mixture of a Reformable Fuel and Steam to a Hydrogen-Containing Reformate Feed Stock Suitable for Consumption by a Fuel Cell Unit," P. Dantowitz, (assigned to General Electric Co.), U.S. 3,541,729 (1970) November 24.

HG16. "Electrically and Chemically Coupled Power Generator and Hydrogen Generator," W. W. Aker, D. H. Brown, H. S. Spacil and D. W. White, (assigned to General Electric Co.), U.S. 3,616,948 (1971) October 26.

HG17. "System and Process Employing a Reformable Fuel to Generate Electrical Energy," P. Chludzinski and J. W. Harrison, (assigned to General Electric Co.), U.S. 3,615,850 (1971) October 26.

HG18. "Thermo-Catalytic Conversion of Hydrocarbons," M. Gerhold, Ger. 1,021,121 (1957) December 19.

HG19. "Thermal-Catalytic Conversion of Gaseous or Liquid Hydrocarbons," M. Gerhold, Ger. 1,034,316 (1958) July 17.

HG20. "Cracking of Hydrocarbons," M. Gerhold, Austrian 205,154 (1959) September 10.

HG21. "Cracking of Hydrocarbons," M. Gerhold, Austrian 205,640 (1959) October 10.

HG22. "Lower-Molecular-Weight Gaseous Carbon Compounds From Liquid Hydrocarbons," M. Gerhold, Brit. 828,639 (1960) February 17.

HG23. "Apparatus for Cracking Hydrocarbons," M. Gerhold, Austrian 210,053 (1960) July 11.

HG24. "Conversion of Hydrocarbons Into Gases Containing Methane, Carbon Monoxide and Hydrogen," M. Gerhold, Brit. 854,150 (1960) November 16.

HG25. "Catalytic Conversion of Hydrocarbons," M. Gerhold, Austrian 214,053 (1961) March 10.

HG26. "Hydrogen by Catalytic Conversion of Hydrocarbon Gas," (assigned to Ges. Fur Lindes Eis-Maschinen A.-G.), Brit. 317,731 (1928) August 20.

HG27. "Hydrogen by Catalytic Conversion of Hydrocarbon Gas," (assigned to Ges. Fur Lindes Eis-Maschinen A.-G.), Fr. 680,488 (1929) August 19.

HG28. "Conversion of CH_4, or Gases Containing it Into a H-CO_2 Mixture," (assigned to Gesellschaft fur Lindes Eismaschinen A.-G.), Ger. 699,489 (1940) October 31.

HG29. "A Gaseous Mixture Rich in Hydrogen," (assigned to Gesellschaft fur Lindes Eismaschinen A.-G.), Ger. 699,489 (1940) October 31.

HG30. "Fractionating Gas Mixtures Into Their Constituents, Using a Circuit of an Auxiliary Substance," (assigned to Gesellschaft fur Lindes Eismaschinen A.-G.), Belg. 446,663 (1942) August 31.

HG31. "Partial Combustion of CH to CO and H," E. Karwat, (assigned to Gesellschaft fur Lindes Eismaschinen A.-G.), Ger. 730,346 (1942) December 10.

HG32. "H-Rich Gaseous Mixtures," (assigned to Gesellschaft fur Lindes Eismaschinen A.-G.), Ger. 741,681 (1943) September 30.

HG33. "Lampblack and Hydrogen," L. Kaiser and T. Lichtenberger, (assigned to Gerwerkschaft ver. Klosterbusch), Ger. 656,555 (1938) February 9.

HG34. "Modular Reformer Furnace," (assigned to Girdler Corp.), Neth. Appl. 6,508,192 (1965) December 27.

HG35. "Catalytic Steam Reforming of Naphtha," B. J. Mayland, C. R. Trimarke, R. L. Harvin and C. S. Brandon, (assigned to Girdler Corp.), U.S. 3,477,832 (1969) November 11.

HG36. "Steam Phase Cracking of Hydrocarbon With Steam to Obtain Hydrogen-Containing Gases," K. H. Kanzler, and P. Guenther, (assigned to Girdler-Suedchemie Katalysator G.m.b.H.), Ger. 1,230,963 (1966) December 22.

HG37. "Hydrogen and Methanol," R. J. A. Grenier, Brit. 271,523 (1926) May 22.

HG38. "Production of Hydrogen," A. R. Griggs, Can. 214,739 (1921) December 20.

HG39. "Hydrogen Production," A. R. Griggs, U.S. 1,466,619 (1923) August 28.

HG40. "Mixtures of Acetylene, Hydrogen, and Other Gases," B. S. Grinenko, U.S.S.R. 103,808 (1956) September 25.

HG41. "Catalysts," W. H. Groombridge and J. E. Newns, Brit. 507,419 (1939) June 9.

HG42. "Carbon," N. Grunstein, Fr. 704,601 (1930) October 20.

HG43. "Production of Gas Comprising Hydrogen and Carbon Monoxide," J. H. Hirsch and M. J. Boegel, (assigned to Gulf Research and Development Co.), U.S. 2,578,475 (1951) December 11.

HG44. "Hydrogen," E. M. Glazier, (assigned to Gulf Research and Development Co.), U.S. 2,728,650 (1955) December 27.

HH1. "Coke-Oven Gas," A. J. E. Hans, Fr. 817,767 (1937) September 10.

HH2. "Pyrolysis of Methane-Hydrogen Mixtures," J. Happel, U.S. 3,156,734 (1964) November 10.

HH3. "Pyrolysis of Methane," J. Happel and L. Kramer, U.S. 3,156,733 (1964) November 10.

HH4. "Hydrogen," H. Harter, Ger. 581,986 (1933) August 5.

HH5. "Hydrogen From Methane," H. Harter, Ger. 585,419 and 585,420 (1933) October 13.

HH6. "Hydrogen or Hydrogen-Nitrogen Mixture," H. Harter, Ger. 583,205 (1933) August 31.

HH7. "Hydrogen From Methane," H. Harter, Ger. 602,111 (1934) September 4.

HH8. "Apparatus for Catalytic Reactions," J. H. Shapleigh, (assigned to Hercules Powder Co.), Brit. 517,744 (1940) February 7.

HH9. "Hydrogen," J. H. Shapleigh, (assigned to Hercules Powder Co.), U.S. 2,173,984 (1940) September 26.

HH10. "Effecting Catalytic Reactions Such as Hydrogen Production From Hydrocarbons and Steam," J. H. Shapleigh, (assigned to Hercules Powder Co.), U.S. reissue 21,521 (1941) July 30.

HH11. "Nitrogen and Hydrogen," J. H. Shapleigh, (assigned to Hercules Powder Co.), Can. 411,483 (1943) March 30.

HH12. "Decomposition of Hydrocarbons," J. H. Shapleigh, (assigned to Hercules Powder Co.), Brit. 640,368 (1950) July 19.

HH13. "Hydrogen," J. H. Shapleigh, (assigned to Hercules Powder Co.), U.S. 2,524,840 (1950) October 10.

HH14. "Hydrogen," J. H. Shapleigh, (assigned to Hercules Powder Co.), U.S. 2,571,953 (1951) October 16.

HH15. "Nickel-Magnesia-Zirconium Silicate Catalyst," J. H. Shapleigh, (assigned to Hercules Powder Co.), U.S. 2,575,324 (1951) November 20.

HH16. "Decomposition of Hydrocarbons," J. H. Shapleigh, (assigned to Hercules Powder Co.), U.S. 2,628,890 (1953) February 17.

HH17. "Catalytic Decomposition of Hydrocarbons to Produce Hydrogen," J. H. Shapleigh, (assigned to Hercules Powder Co.), U.S. 2,639,223(1953) May 19.

HH18. "Hydrogen From Sulfur-Contaminated Hydrocarbons," J. H. Shapleigh, (assigned to Hercules Powder Co.), U.S. 2,830,880 (1958) April 15.

HH19. "Gasification of Hydrocarbons," G. Hilgers, Ger. 1,115,881 (1961) October 26.

HH20. "Dissociating Natural Gas to Produce Carbon and Hydrogen or Water Gas," C. B. Hillhouse, U.S. 1,892,559 (1933) December 27.

HH21. "Apparatus for Electrolyzing Water, Under Pressure," K. Hoffmann, Ger. 529,068 (1928) October 3.

HH22. "Dissociating Hydrocarbons Such as Acetylene for Producing Carbon Black and Hydrogen," J. Machtolf, (assigned to Hostmann-Steinberg'sche Farbenfabriken G.m.b.H.), U.S. 1,782,540 (1931) November 25.

HH23. "Hydrogen-Rich Gases," G. A. Mills, (assigned to Houdry Process Corp.), U.S. 2,647,042 (1953) July 28.

HH24. "Synthesis Gas," G. R. Bond, Jr. and A. G. Oblad, (assigned to Houdry Process Corp.), U.S. 2,754,187 (1956) July 10.

HH25. "Carbon and Hydrogen," A. G. Oblad, T. H. Milliken, Jr. and E. R. Boedeker, (assigned to Houdry Process Corp.), U.S. 2,760,847 (1956) August 28.

HH26. "Synthesis Gas," N. M. Kapp and F. W. Sullivan III, (assigned to Houdry Process Corp.), U.S. 2,844,453 (1958) July 22.

HH27. "Metallurgical Reducing Gas From Gaseous Hydrocarbons or a Gas Containing Gaseous Hydrocarbons," (assigned to Huettenwerk Oberhausen A.-G.), Brit. 890,189 (1962) February 28.

HH28. "Apparatus for the Transformation of Hydrocarbons to Gas Mixtures Suitable for the Direct Reduction of Metal Oxides to Elementary Metals Without an Aftertreatment of the Gas Mixture," L. Von Bogdandy and H. D. Pantke, (assigned to Huettenwerk Oberhausen A.-G.), U.S. 3,536,455 (1970) October 27.

HH29. "Hydrogen," H. G. Terzian, (assigned to Humphreys and Glasgow, Ltd.), Brit. 365,912 (1930) April 30.

HH30. "Gas-Generating Plant for Cyclic Manufacture of Gas From Liquid Fuels," W. Hartley, (assigned to Humphreys and Glasgow, Ltd.), Ger. 1,021,122 (1957) December 19.

HH31. "Fuel Gaes From Liquid Hydrocarbons," (assigned to Humphreys and Glasgow, Ltd.), Ger. 1,043,570 (1958) November 13.

HH32. "Reforming of Methane to Fuel Gas Containing Hydrogen and Carbon Oxides," I. H. Phillipps, (assigned to Humphreys and Glasgow, Ltd.), Brit. 1,117,543 (1968) June 19.

HH33. "Generation of Synthesis Gas," E. W. Riblett, (assigned to Hydrocarbon Research, Inc.), U.S. 2,491,518 (1949) December 20.

HH34. "Generator of Syntheis Gas," P. W. Garbo, (assigned to Hydrocarbon Research, Inc.), U.S. 2,520,925 (1950) September 5.

HH35. "Synthesis Gas," P. W. Garbo, (assigned to Hydrocarbon Research, Inc.), U.S. 2,526,652 (1950) October 24.

HH36. "Generation of Synthesis Gas," E. W. Riblett, (assigned to Hydrocarbon Research, Inc.), Brit. 646.532 (1950) November 22.

HH37. "Fuel Gas," J. C. Kalbach, (assigned to Hydrocarbon Research, Inc.), U.S. 2,609,283 (1952) September 2.

HH38. "Coal Carbonization and Gasification," J. C. Kalbach, (assigned to Hydrocarbon Research, Inc.), U.S. 2,634,198 (1953) April 7.

HH39. "Synthesis Gas," P. C. Keith, (assigned to Hydrocarbon Research, Inc.), U.S. 2,642,346 (1953) June 16.

HH40. "Synthesis Gas," P. W. Garbo, (assigned to Hydrocarbon Research, Inc.), U.S. 2,674,524 (1954) April 6.

HH41. "Synthesis Gas," J. H. Arnold, (assigned to Hydrocarbon Research, Inc.), U.S. 2,752,232 (1956) June 26.

HH42. "Carbon Monoxide and Hydrogen From Heavy Oils," P. W. Garbo, (assigned to Hydrocarbon Research, Inc.), U.S. 2,821,465 (1958) January 28.

HH43. "Hydrogen and Carbon Dioxide," (assigned to Hydrocarbon Research, Inc.), Brit. 844,797 (1960) August 17.

HI1. "Hydrogen, Carbon and Carbon Monoxide by Thermal Decomposition of Hydrocarbons," D. Tyrer, (assigned to Imperial Chemical Industries, Ltd.), Brit. 323,864 (1928) November 16.

HI2. "Hydrogen," D. Tyrer, (assigned to Imperial Chemical Industries, Ltd.), Brit. 328,048 (1929) January 25.

HI3. "Hydrogen," D. Tyrer, (assigned to Imperial Chemical Industries, Ltd.), Brit. 340,050 (1929) October 3.

HI4. "Hydrogen," D. Tyrer, (assigned to Imperial Chemical Industries, Ltd.), Brit. 341,462 (1929) October 3.

HI5. "Hydrogen From Gaseous Hydrocarbons," M. D. Bone, (assigned to Imperial Chemical Industries, Ltd.), Brit. 349,471 (1930) February 26.

HI6. "Hydrogen From Hydrocarbon Gases," D. Tyrer, (assigned to Imperial Chemical Industries, Ltd.), U.S. 1,803,221 (1931) April 28.

HI7. "Hydrogen," B. R. Goodfellow and W. D. Spencer, (assigned to Imperial Chemical Industries, Ltd.), Brit. 370,457 (1932) April 8.

HI8. "Hydrogen," C. F. R. Harrison, (assigned to Imperial Chemical Industries, Ltd.), U.S. 1,875,923 (1933) September 6.

HI9. "Hydrogen-Containing Gases From Hydrocarbons and Steam," R. Holroyd, (assigned to Imperial Chemical Industries, Ltd.), Brit. 728,222 (1955) April 13.

HI10. "Hydrogen-Containing Gases," T. J. P. Pearce, (assigned to Imperial Chemical Industries, Ltd.), Brit. 753,661 (1956) July 25.

HI11. "Catalytic Cracking of Hydrocarbons," (assigned to Imperial Chemical Industries, Ltd.), Fr. 1,307,327 (1962) October 26.

HI12. "Steam Reforming Hydrocarbons," J. G. M. Bremner and T. J. P. Pearce, (assigned to Imperial Chemical Industries, Ltd.), Brit. 916,981 (1963) January 30.

HI13. "Reforming Hydrocarbons With Water Vapor," (assigned to Imperial Chemical Industries, Ltd.), Belg. 622,367 (1963) March 11.

HI14. "Decomposition of Ammonia," (assigned to Imperial Chemical Industries, Ltd.), Belg. 641,469 (1964) June 18.

HI15. "Steam Reforming of Hydrocarbons, D. A. Dowden and P. Davies, (assigned to Imperial Chemical Industries, Ltd.), Brit. 1,032,754 (1966) June 15.

HI16. "Hydrocarbon Reforming to Produce Gases Containing Carbon Monoxide and Hydrogen," E. B. Bates and B. Evans, (assigned to Imperial Chemical Industries, Ltd.), Brit. 1,077,453 (1967) July 26.

HI17. "Steam Reforming of Hydrocarbons," G. W. Bridger and C. R. Redpath, (assigned to Imperial Chemical Industries, Ltd.), Brit. 1,109,426 (1968) April 10.

HI18. "Gases for Reducing Metallic Ores to Metals," A. Pinto, (assigned to Imperial Chemical Industries, Ltd.), Ger. Offen. 2,248,913 (1973) May 3.

HI19. "Carbureting Fuel Gases," K. Peters, H. Mackinger and A. Oppegard, (assigned to Industriebedarf G.m.b.H.), Brit. 1,074,202 (1967) June 28.

HI20. "Steam Cracking of Hydrocarbons to Town Gas," (assigned to Industriebedarf G.m.b.H.), Fr. 1,491,051 (1967) August 4.

HI21. "Apparatus for Forming Acetylene-, Low-Molecular-Weight Olefin-, and Hydrogen-Containing Gaseous Mixtures by Electric arc Discharge Decomposition," N. S. Pechuro and O. Yu. Pesin, (assigned to Institute of Fine Chemical Technology, Moscow), Ger. 1,668,370 (1973) May 17.

HI22. "Gas Interchangeable With Domestic Fuel Gas," C. H. Riesz and P. C. Lurie, (assigned to Institute of Gas Technology), U.S. 2,692,193 (1954) October 19.

HI23. "Hydrogen From Hydrocarbon Reforming," A. R. Khan, (assigned to Institute of Gas Technology), U.S. 3,416,904 (1968) December 17.

HI24. "Fuel-Cell Hydrogen From Hydrocarbons," B. S. Baker, J. Meek, A. R. Khan and H. R. Linden, (assigned to Institute of Gas Technology), U.S. 3,488,171 (1970) January 6.

HI25. "Generation of Hydrogen From Hydrocarbons and Use in Molten Carbonate Fuel Cells," B. S. Baker and A. R. Khan, (assigned to Institute of Gas Technology), U.S. 3,488,226 (1970) January 6.

HI26. "Hydrogen," L. G. Jenness, (assigned to Intermetal Corp.), U.S. 2,164,292 (1939) June 27.

HI27. "Mixtures of Carbon Monoxide and Hydrogen Suitable for the Synthetic Reactions," (assigned to N. V. Internationale Hydrogeneeringsoctrooien Maatschappij), Fr. 845,492 (1939) August 24.

HI28. "Hydrogen and Carbon Monoxide," (assigned to N. V. Internationale Hydrogeneeringsoctrooien Maatschappij), Fr. 845,361 (1939) August 25.

HI29. "Hydrogen and Carbon Black, etc., From Methane," (assigned to International Industrial and Chemical Co., Ltd.), Brit. 352,688 (1929) June 19.

HI30. "Hydrogen-Powered Motive Source," M. S. Newkirk, (assigned to International Materials), U.S. 3,682,142 (1972) August 8.

HI31. "Thermal Decomposition and Gasification of Hydrocarbons in a Fluidized Bed by Using High-Temperature Steam,) K. Daizo, (assigned to Iron and Steel Institute of Japan), Japan. Kokai 72 17,804 (1972) September 11.

HI32. "Hydrocarbon Gasification Plant Employing Sensible Heat From High-Temperature Helium," K. Daizo, (assigned to Iron and Steel Institute of Japan), Japan. Kokai 72 17,802 (1972) September 11.

HI33. "High-Temperature Conversion of Petroleum Residues," L. A. Ivanov, B. G. Kholin and V. I. Poltavskii, U.S.S.R. 136,719 (1961) March 25.

HJ1. "Carbon Black, Unsaturated Gases and Hydrogen," J. J. Jakowsky, U.S. 1,597,277 (1926) August 24.

HJ2. "Steam Reforming Methane to Hydrogen," S. Egashira and H. Matsuoka, (assigned to Japan Gasoline Co., Ltd.), Fr. 1,556,814 (1969) February 7.

HJ3. "Two-Stage Steam Reforming of Hydrocarbons," A. Harie S. Matsuoka and K. Yamamoto, (assigned to Japan Gasoline Co., Ltd.), Japan. Kokai 73 43,702 (1973) June 23.

HJ4. "Acetylene and Hydrogen, etc., From Methane," K. Sasaki, (assigned to Bureau of Industrial Technics), Japan. 1402 (1953) April 22.

HJ5. "Hydrogen From Hydrocarbons," T. Yokota, (assigned to the Minister of the Navy), Japan. 95,140 (1932) March 24.

HJ6. "Hydrogen," E. Japonais, Fr. 658,515 (1928) August 2.

HJ7. "Reactor for Generating Syntheis Gas by Exothermic Catalytic Conversion of Gaseous Hydrocarbons," A. Joklik, K. Keck and M. Keck, Ger. 1,077,193 (1960) March 10.

HK1. "Synthesis Gas," P. C. Keith, U.S. 2,779,667 (1957) January 29.

HK2. "Preparing Mixtures of Carbon Monoxide and Hydrogen Suitable for Use in Catalytic Synthesis," G. Roberts, Jr., (assigned to M. W. Kellogg Co.), U.S. 2,185,989 (1940) January 2.

HK3. "Hydrogen," W. H. Marshall, Jr., (assigned to M. W. Kellogg Co.), U.S. 2,198,560 (1940) April 23.

HK4. "Combined Regenerator and Catalyst Chamber Suitable for Use in Producing Carbon Monoxide and Hydrogen From Carbon Dioxide and Methane," H. M. Nelly, Jr. and H. C. Hottel, (assigned to M. W. Kellogg Co.), U.S. 2,230,467 (1941) February 4.

HK5. "A Synthesis Gas Containing Carbon Monoxide and Hydrogen," G. Roberts, Jr., W. H. Marshall, Jr., D. W. Wilson and P. C. Keith, Jr., (assogned to The M. W. Kellogg Co.), U.S. 2,270,897 (1942) January 27.

HK6. "Aromatized Motor-Fuel Hydrocarbons etc.," E. T. Layng and L. C. Rubin, (assigned to The M. W. Kellogg Co.), U.S. 2,320,147 (1943) May 25.

HK7. "Apparatus for Endothermic Catalytic Reactions Such as CO and H Production From CH_4, CO_2 and H_2O," G. Roberts, Jr., (assigned to The M. W. Kellogg Co.), U.S. 2,355,753 (1944) August 15.

HK8. "Preparation of Hydrogen-Carbon Oxide Mixtures and Catalytic Reactions Thereof," A. Belchetz, (assigned to M. W. Kellog Co.), U.S. 2,577,563 (1951) December 4.

HK9. "Synthesis Gas (From Methane)" C. K. Mader, (assigned to M. W. Kellogg Co.), U.S. 2,579,843 (1951) December 25.

HK10. "A Gaseous Mixture Rich in Hydrogen," C. Alexander and G. H. Palmer, (assigned to M. W. Kellogg Co.), U.S. 2,618,542 (1952) November 18.

HK11. "Gasification of Coal," N. L. Dickinson, (assigned to M. W. Kellogg Co.), U.S. 2,662,007 (1953) December 8.

HK12. "Synthesis Gas," J. W. Jewell, (assigned to M. W. Kellogg Co.), U.S. 2,681,273 (1954) June 15.

HK13. "Hydrocarbon Synthesis Gas," G. A. Vincent, (assigned to M. W. Kellogg Co.), U.S. 2,683,121 (1954) July 6.

HK14. "Nitrogen and Hydrogen for Ammonia Synthesis," M. J. Barry and T. S. Williams, (assigned to M. W. Kellogg Co.), U.S. 2,829,113 (1958) April 1.

HK15. "Removal of Acidic Components From Gaseous Mixtures," W. C. Schreiner and N. Walen, Jr., (assigned to M. W. Kellogg Co.), U.S. 2,912,301 (1959) November 10.

HK16. "Conversion of Gaseous hydrocarbons to Carbon Monoxide and Hydrogen," J. B. Dwyer, (assigned to M. W. Kellogg Co.), U.S. 2,942,958 (1960) June 28.

HK17. "Reforming of Gaseous and Low-Boiling Liquid Hydrocarbons," J. B. Dwyer, J. W. Jewell, W. B. Johnson, H. G. McGrath and L. C. Rubin, (assigned to M. W. Kellogg Co.), Brit. 880,108 (1961) October 18.

HK18. "Hydrocarbon Reforming," (assigned to M. W. Kellogg Co.), Brit. 929,659 (1963) June 26.

HK19. "Hydrogen by Catalytic Steam-Hydrocarbon Reforming," T. E. Lockerbie and J. M. Fox, III, (assigned to M. W. Kellogg Co.), U.S. 3,106,457 (1963) October 8.

HK20. "Hydrogen and Carbon Monoxide," (assigned to M. W. Kellogg Co.), Brit. 939,765 (1963) October 16.

HK21. "Hydrocarbon Reforming Process," (assigned to M. W. Kellogg Co.), Brit. 966,882 (1964) August 19.

HK22. "Conversion of Natural Gas to a Feed Gas for Gasoline Manufacture," V. V. Keltsev, U.S.S.R. 66,698 (1962) August 28.

HK23. "Hydrogen," J. G. King, C. M. Cawley and S. H. Richards, Brit. 572,982 (1945) November 1.

HK24. "Hydrogen," W. Klerapt, Ger. 533,461 (1929) July 21.

HK25. "Cracking of Hydrocarbons to Acetylene, Ethylene, Methane, and Hydrogen with Hydrogen Heated in an Electric Arc," K. Sennewald, K. Gehrmann, L. Strie, L. Bender, E. Schallus and H. W. Stephan, (assigned to Knapsack A.-G.), Ger. 1,468,159 (1970) June 11.

HK26. "Hydrogen," Kokekenkyujo, Brit. 294,958 (1927) August 2.

HK27. "Decomposition of Hydrocarbons, Especially for Purposes of Synthetic Industries," K. Koller and Z. Galocsy, Hung. 134,955 (1948) August 16.

HK28. "Carbon and Hydrogen," A. Kopke, Ger. 584,538 (1933) September 21.

HK29. "Conversion of Gases at High Temperatures, as in Producing Acetylene and Hydrogen From Methane," C. Eymann, (assigned to Koppers Co. of Del.), U.S. 1,957,254 (1934) May 1.

HK30. "Effecting Endothermic Gas Reactions at High Temperatures, as in Production of Hydrogen and Carbon Monoxide From Steam and Methane," W. Linder, (assigned to Koppers Co.), U.S. 2,313,157 (1943) March 9.

HK31. "Fischer-Tropsch Synthesis Gas," W. O. Keeling, (assigned to Koppers Co., Inc.), U.S. 2,590,869 (1952) April 1.

HK32. "Gasification of Fuels," E. E. Donath, (assigned to Koppers Co., Inc.), U.S. 2,751,287 (1956) June 19.

HK33. "Gasification Apparatus With Metallic Water Jacket Nozzle for Steam," F. Totzek, (assigned to Koppers Co., Inc.), U.S. 2,751,286 (1956) June 19.

HK34. "Carbon Monoxide and Hydrogen From Methane," H. Merkel, (assigned to Koppers Co., Inc.), U.S. 2,773,756 (1956) December 11.

HK35. "Oil Gasification," R. Wessolek, (assigned to Koppers Co., Inc.), U.S. 2,776,195 (1957) January 1.

HK36. "Regenerative Heat Use in the Production of Acetylene, Hydrazine, and Other Components From Natural Gas," R. L. Hasche, (assigned to Koppers Co., Inc.), U.S. reissue 24,326 (1957) June 4.

HK37. "Fuel Gases," E. E. Donath, (assigned to Koopers Co., Inc.), Ger. 1,045,030 (1958) November 27.

HK38. "Endothermic Reactions at High Temperatures," H. Koppers and F. Totzek, (assigned to Heinrich Koppers G.m.b.H.), Ger. 685,443 (1939) December 18.

HK39. "Equipment for Conducting of Endothermal Reactions," W. Linder, (assigned to Heinrich Koppers G.m.b.H.), Ger. 703,561 (1941) February 6.

HK40. "Combustible Gases From Liquid or Gaseous Fuels," (assigned to Heinrich Koppers G.m.b.H.), Brit. 716,710 (1954) October 13.

HK41. "Production of Gases Containing Carbon Monoxide and Hydrogen," (assigned to Heinrich Koppers G.m.b.H.), Brit. 726,206 (1955) March 16.

HK42. "The Production of Carbon Monoxide and Hydrogen From Methane," (assigned to Heinrich Koppers G.m.b.H.), Brit. 736,600 (1955) September 14.

HK43. "Gas With High Calorific Value," P. Van Ackeren, (assigned to Heinrich Koppers G.m.b.H.), Ger. 970,391 (1958) September 18.

HK44. "Fuel Gases Rich in Carbon Monoxide and Hydrogen," A. Karl, K. v. Kessel-Zeutsch, A. Haberle and G. Hackstein, (assigned to Heinrich Koppers G.m.b.H.), Ger. 1,093,039 (1960) November 17.

HK45. "Carbon Monoxide-Hydrogen Mixtures From Methane," M. Heinrich, (assigned to Heinrich Koppers G.m.b.H.), Ger. 974,709 (1961) April 6.

HK46. "Catalytic Cleavage of Hydrocarbons in the Presence of Steam to Produce Carbon Monoxide Containing Gas," A. Schmalenbach and H. LeMarie, (assigned to Heinrich Koppers G.m.b.H.), Ger. 1,167,481 (1964) April 9.

HK47. "Pure Hydrogen Gas," (assigned to Heinrich Koppers G.m.b.H.), Fr. 1,366,576 (1964) July 10.

HK48. "Conversion of Hot Cracked Gases Containing Carbon Monoxide," W. Ruehl, (assiogned to Heinrich Koppers G.m.b.H.), Ger. 1,246,689 (1967) August 10.

HK49. "Production of Hydrogen-Containing Gases From Petroleum Hydrocarbons and Catalyst Therefor," (assigned to Heinrich Koppers G.m.b.H.), Brit. 1,079,863 (1967) August 16.

HK50. "Production of Hydrogen-Containing Gases by Steam Cracking of Petroleum Hydrocarbons," K. Kessel, H. Deringer and P. Radusch, (assigned to Koppers, Heinrich, G.m.b.H.), Ger. 1,282,834 (1968) November 14.

HK51. "Simultaneous Production of Oxo Synthesis Gas and Hydrogen; Cracking of Gaseous or Liquid Hydrocarbons," P. Diemer and H. Staege, (assigned to Koppers, Heinrich, G.m.b.H.), Ger. Offen. 1,917,568 (1970) November 5.

HK52. "Continuous Flameless Gasification of Powdered or Fine-Grained Solid Fuels," H. Stage, (assigned to Koppers, Heinrich, G.m.b.H.), Ger. Offen. 2,035,088 (1972) January 20.

HK53. "Hydrogen and Carbon Monoxide by Converting Hydrocarbons With Steam and Carbon Dioxide," (assigned to Koppers N. V.), Dutch 54,279 (1943) April 15.

HK54. "A Carbon Monoxide-Hydrogen Mixture From Hydrocarbons," O. Laubi, (assigned to Krebs and Co. A-G.), Swiss 267,907 (1950) July 1.

HK55. "Recovery of Hydrogen From a Gaseous Mixture," V. A. Kupriyanov, U.S.S.R. 190,352 (1966) December 29.

HK56. "Thermal Cracking of Crude Oils," (assigned to Kureha Chemical Industry Co., Ltd.), Fr. 1,577,043 (1969) August 1.

HL1. "Hydrogen," J. S. Beekley, (assigned to Lazote, Inc.), U.S. 1,711,036 (1929) April 30.

HL2. "Hydrogen," F. C. Blake, (assigned to Lazote, Inc.), U.S. 1,713,325 (1929) May 14.

HL3. "Catalytic Materials, Hydrogen; Oxygen; Gaseous Fuels; Internal-Combustion Engines," C. E. Laurent, Brit. 197,647 (1923) March 1.

HL4. "Hydrogen," T. Lichtenberger and L. Kaiser, Birt. 348,018 (1929) July 10.

HL5. "Hydrogen and Nitrogen Mixtures," R. Linde, U.S. 1,830,610 (1932) November 3.

HL6. "Washing Out Impurities From Hydrogen-Rich Gas Mixtures With Liquid Nitrogen," R. Becker, (assigned to Linde A.-G.), Ger. 1,235,346 (1967) March 2.

HL7. "Fractionation of Air or Hydrogen-Containing Gas Mixtures," G. Kessler and W. Scholz, (assigned to Linde A.-G.), Brit. 1,073,570 (1967) June 28.

HL8. "Hydrogen From Hydrocarbons," E. Karwat and H. Karwat, (assigned to Linde A.-G.), Brit. 1,104,971 (1968) March 6.

HL9. "Preparation of Hydrogen-Nitrogen Mixtures for Ammonia Synthesis," (assigned to Linde A.-G.), Fr. 1,579,207 (1969) August 22.

HL10. "Purification of Hydrogen Produced by Cracking Hydrocarbons," (assigned to Linde A.-G.), Fr. Demande 2,015,667 (1970) April 30.

HL11. "Recovery of a Hydrogen-Nitrogen Mixture From Gases Produced by Cracking Hydrocarbons," W. Foerg, G. Rueckborn and G. Ranke, (assigned to Linde A.-G.), Ger. Offen. 2,007,441 (1971) September 16.

HL12. "Producing Hydrogen or Hydrogen-Rich Gas From Nitrogen-Rich Natural Gas," G. Kandler, (assigned to Linde A.-G.), Ger. 1,567,641 (1972) May 18.

HL13. "Apparatus for Manufacture of Hydrogen-Acetylene Mixtures by Electric-Arc Discharges in Liquid Hydrocarbons," (assigned to Lonza Elektrizitatswerke und Chemische Fabriken A.-G.), Brit. 783,819 (1957) October 2.

HL14. "High-Pressure Electrolyzer," E. A. Zdansky, (assigned to Lonza Elektrizitatswerke und Chemische Fabriken Akt.-Ges.), Swiss 330,814 (1958) August 15.

HL15. "Hydrogen," (assigned to L'oxhydrique Francaise), Fr. 649,724 (1927) July 18.

HL16. "Hydrogen Gas," (assigned to Lummus Co.), Neth. Appl. 6,509,502 (1966) January 24.

HL17. "Reforming of Hydrocarbons," (assigned to Lummus Co.), Neth. Appl. 6,513,505 (1966) April 20.

HL18. "Hydrogen From Methane and Water," S. A. Guerrieri, (assigned to Lummus Co.), Fr. 1,503,018 (1967) Nomver 24.

HL19. "Steam Reforming of Light Hydrocarbons to Produce Hydrogen-Rich Gas," S. A. Guerrieri, (assigned to Lummus Co.), U.S. 3,524,819 (1970) August 18.

HL20. "Steam Reforming of Carbon Monoxide-Rich Hydrocarbon Feeds," I. N. Banchik, M. C. Sze and M. J. Maddock, (assigned to Lummus Co.), U.S. 3,527,565 (1970) September 8.

HL21. "Steam Reforming of Hydrocarbon Feed Stocks," T. Sheldon, (assigned to Lummus Co.), Ger. Offen 2,022,076 (1970) November 19.

HL22. "Reforming Hydrocarbon Feeds to Manufactue Carbon Monoxide and Hydrogen," T. Sheldon, (assigned to Lummus Co.), Ger. Offen. 2,148,430 (1972) April 6.

HL23. "High-Temperature, High-Pressure Shift Reactor for Synthesis Gas," G. Friedman, (assigned to Lummus Co.), Ger. Offen. 2,250,036 (1973) April 19.

HM1. "Oxidative Cracking of Higher Hydrocarbons," J. Macak, P. Nobst, D. Petzold, R. Schrader and G. Tetzner, Ger. (East) 93, 752 (1972) November 12.

HM2. "Hydrogen by Conversion of Carbon Monoxide With Steam, A. G. Carter, (assigned to Magnesium Metal Corp. Ltd.), Brit. 604, 376 (1948) July 2.

HM3. "Partial Oxidation of Hydrocarbons to Acetylene and Synthetic Gas," Z. Sebestyen, P. Benedek, A. Laszlo and A. Nemeth, (assigned to Magyar Asvanyolyaj es Foldgazkiserleti Intezet), Hung. 150, 618 (1961) Appl. July 10.

HM4. "Flame-Reaction Transformation of Saturated Hydrocarbons to Unsaturated Hydrocarbons," F. Mihaly, N. Zoltan and S. Laszlo, (assigned to Magyar Asvanyolaj es Foldgazkiserleti Intezet), Hung. 152, 848 (1966) May 22.

HM5. "Manufacture of Hydrogen With Simultaneous Production of Metals," V. Maly, M. Koleda and D. Ochodnicky, Czech. 137, 461 (1970) July 15.

HM6. "Production of Hydrogen," W. H. Marshall, Jr., Belg. 645, 993 (1964) July 31.

HM7. "Production of Hydrogen," W. H. Marshall, Jr., Neth. Appl. 6, 404, 257 (1965) October 18.

HM8. "Process for Production of Hydrogen," W. H. Marshall, Jr., U.S. 3, 297, 408 (1967) January 10.

HM9. "Synthesis Gas," O. Herwig, (assigned to Maschinenfabrik Augsburg-Nurnberg, Akt.-Ges.), U.S. 2, 909, 416 (1959) October 20.

HM10. "Lampblack and Hydrogen," H. J. Masson, U.S. 1, 418, 385 (1922) June 6.

HM11. "Hydrogen," C. Matignon and M. Seon, Fr. 713, 487 (1931) March 18.

HM12. "Gasblack and Hydrogen From Methane," C. D. McCourt and C. Ellis, U.S. 1, 276, 385 (1918) August 20.

HM13. "Manufacturing Gasblack, Hydrogen etc.," C. D. McCourt, Can. 187, 661 (1918) november 26.

HM14. "Acetylene and Hydrogen From Liquid Hydrocarbons," Y. Mercier, Brit. 316, 336 (1928) April 20.

HM15. "Device for the Production of Industrial Gases," C. Mertens, Ger. 1, 223, 987 (1966) September 1.

HM16. "Shaft Furnace for the Production of Hydrogen From Iron and Steam," A. Messerschmitt, Ger. 291,902 (1914) February 12.

HM17. "Gases Rich in Hydrogen," (assigned to Metallgesellschaft A.-G.), Brit. 504,529 (1939) April 26.

HM18. "Synthesis Gas Also Useful as Fuel Gas," O. Dorschner, (assigned to Metallgesellschaft Akt.-Ges.), Ger. 901,052 (1954) January 7.

HM19. "Catalytic Cracking of Hydrocarbons," O. Hubmann, E. Kapp and H. Hiller, (assigned to Metallgesellschaft Akt.-Ges.), Ger. 1,014,528 (1957) August 29.

HM20. "Apparatus for Catalytic Cracking of Low-Boiling Hydrocarbon Gases," (assigned to Metallgesellschaft A.-G.), Brit. 944,132 (1963) December 11.

HM21. "Cracking of Hydrocarbons," H. Hiller and H. Bechthold, (assigned to Metallgesellschaft A.-G.), Fr. 1,364,459 (1964) June 19.

HM22. "Flameless Conversion of Hydrocarbons Into a Mixture of Carbon Dioxide, Carbon Monoxide, and Hydrogen," G. Baron, H. Bechthold and H. Hiller, (assigned to Metallgesellschaft A.-G.), Brit. 1,094,633 (1967) December 13.

HM23. "Flameless Conversion of Hydrocarbons Into Hydrogen-Containing Gas Mixtures," G. Baron, K. Bratzler and H. Leibgott, (assigned to Metallgesellschaft A.-G.), S. African 67 06,121 (1968) February 19.

HM24. "Vaporization of Liquid Methane: Recovery of Hydrogen and Synthesis Gas," (assigned to Metallgesellschaft A.-G.), Fr. 1,550,011 (1968) December 13.

HM25. "Hydrogen From High-Boiling Hydrocarbon Fuels," P. D. Becker, (assigned to Metallgesellschaft A.-G.), Ger. Offen. 1,811,381 (1970) July 2.

HM26. "Ammonia Synthesis Gas," P. D. Becker, (assigned to Metallgesellschaft A.-G.), Ger. Offen. 1,920,001 (1970) December 17.

HM27. "Synthesis Gas for Ammonia," P. D. Becker, (assigned to Metallgesellschaft A.-G.), Ger. Offen. 1,924,642 (1971) February 4.

HM28. "Producing Hydrogen or Ammonia Synthesis Gas at Medium Pressure," E. Kapp and P. Becker, (assigned to Metallgesellschaft A.-G.), Ger. Offen. 1,958,033 (1971) June 3.

HM29. "Catalytic Gasification of High-Boiling Hydrocarbons With Hydrogen and Oxygen," G. Baron, H. Bechtold and H. Liebgott, (assigned to Metallgesellschaft A.-G.), Ger. Offen. 2,012,529 (1971) October 7.

HM30. "Continuous Oxidative Cracking of Hydrocarbons," G. Baron and H., Bechthold, (assigned to Metallgesellschaft A.-G.), Ger. Offen. 2, 117, 236 (1972) October 26.

HM31. "Reducing-Gas for the Blast-Furnace Process From Natural Gas," H. Jochel and H. J. Renner, (assigned to Metallgesellschaft A.-G.), Ger. Offen. 2, 141, 875 (1971) August 20.

HM32. "Hydrogen," (assigned to Metal Research Corp.), Ger. 503, 111 (1925) October 29.

HM33. "Hydrogen and Carbon Monoxide From Hydrocarbon Gases," S. Hideo, T. Tan, K. Ryuichi and K. Yoshiaki, (assigned to Mitsubishi Chemical Industries, Ltd.), Japan 5221 (1958)

HM34. "Gas Mixture Containing Hydrogen and Carbon Monoxide," A. Tetsutaro and O. Michio, (assigned to Mitsubishi Chemical Industries, Ltd.), Japan 71 00, 802 (1971) January 9.

HM35. "Dealkylated Aromatics and Hydrogen," U. Masao and M. Shoichiro, (assigned to Mitsubishi Petrochemical Co., Ltd.), Ger. Offen. 2, 259, 380 (1973) July 5.

HM36. "Charging Apparatus for Shaft Furnaces, Particularly Gas Producers," R. Moller, Ger. 824, 821 (1951) December 13.

HM37. "Partial Combustion of Hydrocarbons," S. L. Knapp, (assigned to Monsanto Co.), U.S. 3, 399, 245 (1968) August 27.

HM38. "Continuous Preparation and Conversion of Water Gas Into Synthesis Gas," (assigned to Montecatini), Ital. 439, 334 (1948) September 16.

HM39. "Synthesis Gas," G. Greco, (assigned to Montecatini Societa Generale perl' Industria Mineraria e Chimica), Ital. 446, 318 (1949) March 16.

HM40. "Hydrogen and Carbon Monoxide From Fuel Oils," G. Fauser, (assigned to Montecatini Societa Generale perl' Industria Mineraria e Chimica), Ital. 492, 741 (1954) April 5.

HM41. "Synthesis Gas," G. Greco, (assigned to Montecatini Societa Generale perl' Industria Mineraria e Chimica), Ital. 525, 183 (1955) April 30.

HM42. "Synthesis Gas," G. Greco, (assigned to Montecatini Societa Generale perl' Industria Mineraria e Chimica), Ital. 533, 717 (1955) September 27.

HM43. "Synthesis Gas," (assigned to Montecatini Societa Generale per l'Industria Mineraria e Chimica), U.S. 2, 772, 955 (1956) December 4.

HM44. "Synthesis Gas From Oxygen and Volatile Petroleum Hydrocarbons," (assigned to Montecatini Societa Generale perl' Industria Mineraria e Chimica), Brit. 784,378 (1957) October 9.

HM45. "Synthesis Gas From Alkanes," (assigned to Montecatini Edison S.p.A.), Neth. Appl. 6,611,310 (1967) February 20.

HM46. "Synthesis-Gas Mixtures for Ammonia and Methanol," G. Pagani, (assigned to Montecatini Edison S.p.A.), Fr. 1,489,535 (1967) July 21.

HM47. "Hydrocracking of Hydrocarbons," W. H. Munro, U.S. 3,694,344 (1972) September 26.

HN1. "Hydrogen-Nitrogen Gas Mixtures," J. A. Yunker, (assigned to Natural Gas Hydrogen Corp.), U.S. 1,901,884 (1933) March 21.

HN2. "Tube Furnace for production of Hydrogen-Carbon Oxide Mixture," R. M. Redd, (assigned to National Cylinder Gas Co.), U.S. 2,654,657 (1953) October 6.

HN3. "Catalyst for the Production of Hydrogen and Carbon Dioxide," D. C. Christian and R. M. Reed, (assigned to National Cylinder Gas Co.), U.S. 2,662,063 (1953) December 8.

HN4. "Mixtures of Hydrogen and Carbon Oxides," A. R. Melvin and H. M. Baugh, (assigned to National Cylinder Gas Co.), U.S. 2,668,101 (1954) February 2.

HN5. "Hydrogen From Water Gas," H. Nielsen and B. Laing, Brit. 342,817 (1929) November 22.

HN6. "Nickel Catalysts for Gasification of Lower Hydrocarbons," E. Takashi, Y. Tamechika, T. Yukio and K. Kyozo, (assigned to Nippon Gas Chemical Industries Ltd., and Nikki Chemical Co.), Japan. 2470 (1958) April 10.

HN7. "Apparatus for Catalytic Synthesis-Gas-Production From Hydrocarbons," G. Tokio and S. Haruo, (assigned to Nippon Volatile Oil Co.), Japan 3005 (1960) April 4.

HN8. "Iron Catalyst for Manufacture of Water Gas," M. Kawamura, (assigned to Nissin Chemical Industries Co.), Japan. 654 (1951) February 16.

HN9. "Hydrogen," (assigned to Nitrogen Corporation), Brit. 163,703 (1921) May 17.

HN10. "Production of Hydrogen," I. G. Nixon, Brit. 1,187,782 (1970) April 15.

HN11. "Cell for Electrolytic Manufacture of Oxygen and Hydrogen," C. F. Holmboe, (assigned to DeNordiske Fabriker), Ger. 467,399 (1924) November 16.

HN12. "Hydrogen," A. Nouvelle, Brit. 256,631 (1925) August 5.

HO1. "Combustible (Gas by Reforming Hydrocarbons)" W. W. Odell, U.S. 2,592,591 (1952) April 15.

HO2. "Hydrogen," (assigned to Oesterreichisch Amerikanische Magnesit A.-G.), Birt. 417,829 (1934) October 12.

HO3. "Improving the Thermal Efficiency and Operation of a Gas Producer," (assigned to Office Central de Chauffe Rationnelle), Brit. 922,892 (1963) April 3.

HO4. "Hydrogen," C. Toniolo, (assigned to Dr. Rossi Officine Elettrochimicke), Brit. 152,554 (1920) January 5.

HO5. "Hydrogen and Carbon Monoxide From Methane," (assigned to Office National Industriel de l azote), Fr. 976,553 (1951) March 20.

HO6. "Conversion of Liquid Hydrocarbons Into Industrial Gases," (assigned to Office National Industriel de l' azote), Brit. 728,895 (1955) April 27.

HO7. "Hydrogen," (assigned to Office National Industriel de l' Azote), Brit. 772,787 (1957) April 17.

HO8. "Cyclic Catalytic Process for Steam Conversion of Hydrocarbons Rich in Sulfur Compounds," (assigned to Office National Industriel de l'azote), Fr. 1,145,781 (1957) October 29.

HO9. "Synthesis Gas High in Carbon Monoxide and Hydrogen," (assigned to Office National Industriel de l' azote), Fr. 1,158,920 (1958) January 20.

HO10. "Gas-Mixture Preparation by Cracking of Hydrocarbons," Marcel Patry, (assigned to Office National Industriel de l' azote), Fr. addn. 67,709 (1958) March 14.

HO11. "Cyclic Catalytic Conversion of Hydrocarbons in the Presence of Combustion Gases Containing Hydrogen and Oxides of Carbon," Marcel party (assigned to Office National Industriel de l azote), Fr. Addn. 79,352 (1962) November 23.

HO12. "Catalytic Conversion of Hydrocarbons," Marcel Party, (assigned to Office National Industriel de l azote), Ger. 1,146,037 (1963) March 28.

HO13. "Fuel Gas From Petroleum," P. Claude and J. Sarlabous, (assigned to Office National Industriel de l' azote), Belg. 640,818 (1964) April 1.

HO14. "Steam Reforming Paraffinic Hydrocarbons," S. Pupko, (assigned to Office National Industriel de l' azote), U.S. 3,408,171 (1968) October 29.

HO15. "Carbon Black, CO and H From Hydrocarbon Gases," W. D. Wilcox, (assigned to Oil and Gas Research, Inc.), U.S. 2,322,989 (1944) June 29.

HO16. "Ammonia Synthesis-Gas Reactor," C. Monfort, (assigned to Onia-Gegi), Fr. 1,564,893 (1969) April 25.

HO17. "Reforming Plant for Synthesis Gas," C. Monfort, (assigned to Onia-Gegi), Ger. Offen. 2,030,462 (1971) January 7.

HO18. "Countercurrent Continuous Method for Iron-Steam Production of Hydrogen," D. I. Orochko, T. Kh. Melik-Akhnazarov and G. N. Poluboyarinov, U.S.S.R. 113,690 (1958) August 20.

HO19. "Industrial Gas," F. Weinrotter, (assigned to Osterreichische Stickstoffwerke A.-G.), Austrian 173,675 (1953) January 10.

HO20. "Mixtures Containing Hydrogen and Carbon Monoxide," (assigned to Osterreichische Stickstoffwerke A.-G.), Brit. 714,464 (1954) August 25.

HO21. "Synthesis Gas," F. Weinrotter and M. Naumann, (assigned to Osterreichische Stickstoffwerke A.-G.), Austrian 191,850 (1957) September 25.

HO22. "Synthesis Gas," F. Leithe and R. Mewes, (assigned to Dr. C. Otto and Co. G.m.b.H.), Ger. 916,662 (1954) August 16.

HO23. "Synthesis Gas," (assigned to Dr. C. Otto and Co. G.m.b.H.), Brit. 737,394 (1955) September 28.

HO24. "Hydrogen-Carbon Monoxide Synthesis Gas," (assigned to Dr. C. Otto and Co. G.m.b.H.), Brit. 777,325 (1957) June 19.

HO25. "Endothermic Treatment of Gases Containing Hydrocarbons," (assigned to Dr. C. Otto and Co. G.m.b.H.), Brit. 885,158 (1961) December 20.

HO26. "Hydrogen," (assigned to Oxhydrique Francaise), Brit. 294,150 (1927) July 18.

HP1. "Carbon, Hydrogen and Hydrocarbons," C. Padovani, Brit. 395,893 (1933) July 27.

HP2. "Production of Fuel Gas," C. Padovani, Brit. 1,092,100 (1967) November 22.

HP3. "Manufacture of Hydrogen," V. V. Patrikeev, A. A. Balandin and V. F. Odyakov, U.S.S.R. 324,211 (1971) December 23.

HP4. "Producing Light Products From Heavy Hydrocarbons," J. T. Patton and T. W. Gillette, U.S. 3,684,689 (1972) August 15.

HP5. "Reactor for the Decomposition of Liquid Hydrocarbons by the Electric Discharge Process," N. S. Pechuro and Yu. O. Pesin, U.S. 3,519,551 (1970) July 7.

HP6. "Commercial Hydrogen From Water Gas," G. A. Perley, U.S. 1,896,916 (1933) February 7.

HP7. "Hydrogen and Hydrocarbons From Methane," (assigned to Petrole Synthetique Soc. Anon. and A. Folliet), Brit. 261,267 (1926) April 29.

HP8. "Hydrogen and Hydrocarbons by Decomposition of Methane etc.," (assigned to Petrole Synthetique Soc. Anon. and A. Folliet), Brit. 271,767 (1927) January 1.

HP9. "Hydrogen," C. J. Helmers and P. H. Johnson, (assigned to Phillips Petroleum Co.), U.S. 2,513,022 (1950) June 27.

HP10. "Synthesis Gas," B. J. Mayland, (assigned to Phillips Petroleum Co.), U.S. 2,546,606 (1951) March 27.

HP11. "Synthesis Gas," B. J. Mayland and A. Clark, (assigned to Phillips Petroleum Co.), U.S. 2,566,620 (1951) September 4.

HP12. "Synthesis Gas," J. C. Krejci, (assigned to Phillips Petroleum Co.), U.S. 2,605,174 (1952) July 29.

HP13. "Synthesis Gas," S. G. Stewart, (assigned to Phillips Petroleum Co.), U.S. 2,606,158 (1952) August 5.

HP14. "Hydrocarbon Synthesis Gas," B. J. Mayland, (assigned to Phillips Petroleum Co.), U.S. 2,609,382 (1952) September 2.

HP15. "Synthesis Gas," B. J. Mayland, (assigned to Phillips Petroleum Co.), U.S. 2,655,442 (1952) October 13.

HP16. "Carbon Monoxide and Hydrogen Synthesis Gas," B. J. Mayland, (assigned to Phillips Petroleum Co.), U.S. 2,618,543 (1952) November 18.

HP17. "Reforming Natural Gas to Produce Hydrogen and Carbon Monoxide Synthesis Gas," B. J. Mayland, (assigned to Phillips Petroleum Co.), U.S. 2,622,089 (1952) December 16.

HP18. "Synthesis Gas," B. J. Mayland, (assigned to Phillips Petroleum Co.), U.S. 2,628,161 (1953) February 10.

HP19. "Hydrogen From Hydrocarbons," S. P. Robinson, (assigned to Phillips Petroleum Co.), U.S. 2,647,041 (1953) July 28.

HP20. "Synthesis Gas," T. B. Hudson, (assigned to Phillips Petroleum Co.), U.S. 2,661,270 (1953) December 1.

HP21. "Synthesis Gas," B. J. Mayland, (assigned to Phillips Petroleum Co.), U.S. 2,684,895 (1954) July 7.

HP22. "Carbon Black and Synthesis Gas," L. W. Pollock, (assigned to Phillips Petroleum Co.), Brit. 719,221 (1954) December 1.

HP23. "Gas Producer for Acetylene-Synthesis Gas Mixtures," E. L. Jones, (assigned to Phillips Petroleum Co.), U.S. 2,697,032 (1954) December 14.

HP24. "Hydrogen," C. K. Buell and A. Clark, (assigned to Phillips Petroleum Co.), U.S. 2,699,986 (1955) January 18.

HP25. "Fuel Gas," L. C. Bearer, (assigned to Phillips Petroleum Co.), U.S. 2,714,059 (1955) July 26.

HP26. "Synthesis Gas," S. G. Stewart, (assigned to Phillips Petroleum Co.), U.S. 2,719,130 (1955) September 27.

HP27. "Recovery of Gaseous Products From Thermal Cracking of Gaseous Hydrocarbons," F. E. Gilmore, (assigned to Phillips Petroleum Co.), U.S. 2,848,522 (1958) August 19.

HP28. "Catalyst Reactivation in the Production of Hydrogen for Ammonia Synthesis," R. R. McMullan, (assigned to Phillips Petroleum Co.), U.S. 3,027,237 (1962) March 27.

HP29. "Fractionation and Conversion of a Naphtha Fraction," C. S. Kelley, E. J. Cabanaw and V. A. Cawi, (assigned to Phillips Petroleum Co.), U.S. 3,384,570 (1968) May 21.

HP30. "Hydrogen From Excess Refinery Streams Ranging From C_6 to Heavy Oils," H. J. Hepp, (assigned to Phillips Petroleum Co.), U.S. 3,552,924 (1971) January 5.

HP31. "Making Carbon Monoxide and Hydrogen," R. P. Pictet, U.S. 1,228,818 (1917) June 5.

HP32. "Manufacture of Hydrogen and Hydrogen Mixtures," R. P. Pictet, Can. 184,460 (1918) May 21.

HP33. "Gasification Electrochemical System," E. Gorin, (assigned to Pittsburgh Consolidation Coal Co.), U.S. 2,581,651 (1952) January 8.

HP34. "Hydrogen," (assigned to Pittsburgh Consolidation Coal Co.), Brit. 673,332 (1952) June 4.

HP35. "Hydrogen," E. Gorin, (assigned to Pittsburgh Consolidation Coal Co.), U.S. 2,781,248 (1957) February 12.

HP36. "Manufacturing Hydrogen by the Steam-Iron Process," A. T. Grisenthwaite and R. W. Rutherford, (assigned to The Power-Gas Corp., Ltd.), Brit. 544,664 (1942) April 22.

HP37. "Synthesis Gas Rich in Hydrogen," A. Grisenthwaite, (assigned to Power-Gas Corp., Ltd.), Brit. 831,263 (1960) March 23.

HP38. "Fuel Gases From Hydrocarbons," J. Swaine, H. Caradoc and F. F. Rixon, (assigned to Power-Gas Corp., Ltd.), Brit. 866,161 (1961) April 26.

HP39. "Carburetted Fuel," K. Ruschin and E. R. Ward, (assigned to Power-Gas Corp., Ltd.), Brit. 961,076 (1964) June 17.

HP40. "Production of Reducing Gas," G. Milner, (assigned to Power-Gas Corp., Ltd.), Brit. 1,149,114 (1969) April 16.

HP41. "Process and Arrangement for Conversion of Naphtha," R. J. Dain, G. Pawson and K. Irish, (assigned to Power-Gas Corp., Corp.), Ger. Offen. 1,802,505 (1969)

HP42. "Oil Cracking (With Hydrogen and Methane Production)" H. B. Cooke, (assigned to Process Management Co.), U.S. 2,128,220 (1938) August 30.

HP43. "Apparatus for Generating Gas to be Used in Hydrogenation of Petroleum," M. J. Trumble and W. L. Seeley, (assigned to Processco, Ltd.), U.S. 1,948,808 (1934) February 27.

HP44. "Hydrogen," A. Prudhomme, Fr. 800,048 (1936) June 25.

HP45. "Manufacture of Pure Hydrogen and Regeneration of the By-Products Obtained," R. Puel-Bero, Belg. 400,366 (1934) January 31.

HP46. "Production of Hydrogen-Containing Gases Particularly Useful for Ammonia Synthesis," O. J. Quartulli and S. Kao, (assigned to Pullman Inc.), Brit. 991,523 (1965) May 12.

HP47. "Hydrogen Production by Steam Reforming of Liquid Hydrocarbons," (assigned to Pullman Inc.), Brit. 1,011,294 (1965) November 21.

HP48. "Rapid-Quench Apparatus for High-Temperature Gases," R. S. Eagle, and E. G. Hendrick, Jr., (assigned to Pullman Inc.), U.S. 3,232,726 (1966) February 1.

HP49. "Production of Hydrogen From Hydrocarbons for Use in Ammonia Synthesis," O. J. Quartulli and S. Kao, (assigned to Pullman Inc.), U.S. 3,264,066 (1966) August 2.

HP50. "Production of Hydrogen-Containing Gases From Hydrocarbons," D. A. Vorum, (assigned to Pullman Inc.), U.S. 3,278,452 (1966) October 11.

HP51. "Hydrogen-Rich Gas Mixture," O. J. Quartulli, (assigned to Pullman Inc.), Ger. 1,293,133 (1969) April 24.

HP52. "Hydrogen From Hydrocarbons and Steam," J. F. McMahon and T. H. Milliken, (assigned to Pullman Inc.), U.S. 3,476,536 (1969) November 4.

HP53. "Catalytic Steam Reforming of Ethanes and Ethylenes," J. F. McMahon, (assigned to Pullman Inc.), Ger. 1,417,798 (1970) October 1.

HP54. "Producing Strongly Reducing Gases by Two-Step, Catalytic Vapor Reforming of Hydrocarbons," J. B. Dwyer, (assigned to Pullman Inc.), Ger. Offen. 2,118,946 (1972) March 30.

HP55. "Hydrocarbon-Reforming Apparatus and Method," R. W. Pfeiffer, (assigned to Pullman Inc.), Ger. Offen. 2,156,402 (1973) May 17.

HR1. "Catalytic Production of Hydrogen From a Hydrocarbon," F. Goebel, (assigned to Rand Development Corp.), U.S. 3,650,697 (1972) March 21.

HR2. "Carbon Black and Carbon Monoxide-Hydrogen Gas Mixtures From Natural Gas," F. C. Reed, U.S. 2,173,695 (1940) September 19.

HR3. "Alcohols, Aldehydes, Ketones, Hydrocarbons and Hydrogen From Vegetable Substances," E. L. Rinman, Brit. 334,724 (1929) July 16.

HR4. "Alcohols, Aldehydes, Ketones and Hydrogen From Vegetable Substances," E. L. Rinman, Brit. 353,665 (1930) May 26.

HR5. "Hydrogen," E. L. Rinman, Fr. 801,469 (1936) August 5.

HR6. "Hydrogen-Nitrogen Mixtures," H. Ritter, Brit. 343,054 (1928) November 9.

HR7. "Nitrogen-Hydrogen Mixtures," H. Ritter, W. Gluud, W. Klempt and R. Bestehorn, Ger. 652,248 (1937) October 28.

HR8. "Nitrogen-Hydrogen Mixtures," H. Ritter and W. Klempt, Ger. 653,776 (1937) December 3.

HR9. "Hydrogen From Hydrocarbons," H. Ritter, Ger. 673,773 (1939) March 29.

HR10. "Recovery of Hydrogen, Carbon Monoxide, and Other Gases From Water Scrubbing at Elevated Pressure," R. Roediger and R. Schmeisser, Ger. (East) 40,205 (1965) July 25.

HR11. "Cracking Process," P. H. Royster, U.S. 2,470,578 (1949) May 17.

HR12. "Hydrogen and Carbon From Methane," (assigned to Ruhrchemie A.-G.), Brit. 359,413 (1928) December 6.

HR13. "Utilization of the Heat Content and Hydrogen Content of Methane," (assigned to Ruhrchemie A.-G.), Fr. 686,161 (1929) December 5.

HR14. "Catalytic Hydrogenation of Carbon Monoxide," W. Rottig, (assigned to Ruhrchemie A.-G.), Ger. 925,826 (1955) March 31.

HR15. "Chemical and Metallurgical Reactions at High Temperatures," H. de Rycker, Belg. 508,270 (1952) May 1.

HS1. "Reactive, Tar-Free Carbon Black and Pure Hydrogen," J. Strickrodt, (assigned to Salzgitter Chemie G.m.b.H.), Ger. 1,243,651 (1967) July 6.

HS2. "Acetylene and Hydrogen From Hydrocarbons, Such as Methane," K. Sasaki, Japan 122 (1954) January 11.

HS3. "Acetylene and Hydrogen From Natural Gas," K. Sasaki, Japan 1480 (1954) March 20.

HS4. "Hydrogen and Carbon Monoxide From Hydrocarbons," H. Schmalfeldt, Ger. 893,046 (1953) October 12.

HS5. "Apparatus for Making Carbon Black and Hydrogen From Hydrocarbons, or for Cracking Hydrocarbon Oils," R. Schuchner, Ger. 541,331 (1927) August 21.

HS6. "Production of Hydrogen," S. C. Schuman, U.S. 3,388,971 (1968) June 18.

HS7. "Automatic Apparatus for Determining Petroleum Product fraction," P. N. Segida, U.S.S.R. 168,047 (1965) February .

HS8. "Refined Oil and Hydrogen From Lignite Pitch, Anthracite Pitch etc.," F. Seidenschnur, Ger. 712,431 (1941) September 25.

HS9. "Simultaneous Manufacture of Hydrogen and of a Hydrogen-Carbon Monoxide Mixture," (assigned to Selas of America), Fr. 1,559,142 (1969) March 7.

HS10. "Catalysts," (assigned to The Selden Co.), Fr. 671,105 (1929) March 8.

HS11. "Hydrogen and Carbon Monoxide," M. De Simo, (assigned to the Shell Development Co.), Can. 319,121 (1932) January 19.

HS12. "Hydrogen From Hydrocarbons," F. M. Pyzel, (assigned to Shell Development Co.), U.S. 1,896,420 (1933) February 7.

HS13. "Hydrogen and Carbon Monoxide From Natural Gas and Zinc Oxide etc.," N. De Simo, (assigned to Shell Development Co.), U.S. 1,899,184 (1933) February 28.