

2139

<u>Patent No.</u>	<u>Date</u>	<u>Inventor</u>	<u>Title</u>
4,122,890	10-31-78	Larry P. Atkins James R. Bish	Nozzle for the Continuous Casting of Lead
4,123,729	10-31-78	Earl H. Buetemeister	Displacement Transducer
4,129,107	12-12-78	James A. Boyer	Magnetic Pickup type Ignition Distributor

-1979-

4,135,390	2-13-79	Jackson R. Templin	Engine Torque Transducer
4,150,714	4-24-79	Larry P. Atkins James R. Bish	Lead Casting Seal
4,153,850	5-8-79	James A. Boyer	Circuit for Square Wave Output
4,154,907	5-15-79	Jerry V. Crow	Side Terminal Battery Structure
4,161,665	7-17-79	Charles E. Buck James M. Johnson Paul A. Joseph	Engine Detonation Sensor
4,164,633	8-14-79	John J. Sheridan Willard E. Graddy Willis H. Anderson	Push-Pull Rotary System
4,177,551	12-11-79	George S. Johnson Robey C. Reff	Arc Welded Battery Inter-cell Connector
4,179,647	12-18-79	Donald L. Cummins Daniel W. Stahura	Dual Output Battery Charging System

= 1980 =

4,200,143	4-29-80	Robert C. Matter James R. Bish	Continuous Horizontal Caster
4,208,554	6-17-80	Richard L. Sprague	Ignition Distributor Rotor having a Silicone Varnish Coated Output Segment for Suppressing Noise and a Method of Manufacture therefor.

<u>Patent No.</u>	<u>Date</u>	<u>Inventor</u>	<u>Title</u>
4,208,615	6-17-80	Billy R. Jones John J. Sheridan	Automatic Headlamp Control System
4,210,998	7-8-80	Conrad L. Gaunt	Toughening of PVC- Separator-Enveloped Battery Plates
4,221,982	9-9-80	Louis J. Raver Gene D. Bricker	Liquid Cooled Recti- field-Alternating Current Generator
4,228,580	10-21-80	Robert C. Matter	Process for Making Wrought, Lead-Calcium Battery Grid Alloy Having High Temperative Tensile Strength Sta- bility.
4,228,684	10-21-80	Jackson R. Templin	Remote Temperative Measuring System with Semiconductor Junction Temperature
4,232,514	11-11-80	James H. Flatt	Dump Control for Turbine Gate Valve Actuator
4,236,107	11-25-80	Jackson R. Templin	Secondary Cell Charging System
4,237,205	12-2-80	Robert C. Matter	Pocket Grid for Alka- line Battery Plates
4,237,603	12-9-80	Jerry V. Crow	Method for Assembling a Terminal to a Battery Side Wall

1981

4,249,425	2-10-81	Richard D. Watson	Automatic Belt Tension- ing Mechanism
4,252,756	2-24-81	Van V. Riesberg, Jr.	Process For Manufactur- ing Ultra-Thin Sintered PVC Battery Separators
4,271,586	6-9-81	Charles P. McCartney, Jr.	Method of Making Battery Plates

<u>Patent No.</u>	<u>Date</u>	<u>Inventor</u>	<u>Title</u>
4,279,977	7-21-81	Robert C. Matter	Lead-Calcium-Tin Battery Grid
4,281,277	7-28-81	Leroy E. Lakey	Dual Secondary Cell Charging System
4,289,722	9-15-81	Glen E. Tranbarger	Method of Potting Magnetic Speed Pick-Up
4,291,586	8-29-81	Earl H. Buetemeister	Shift Control Mechanism For A Countershaft Transmission
4,294,895	10-13-81	Larry P. Atkins	Battery Vent Cap For Preventing Electrolyte Foam Escape
4,295,069	10-13-81	David E. Givan Charles R. Ashton	Armature Shaft For A Vehicle Starter Motor
4,298,342	11-3-81	Kenneth H. Clayton Charles D. Denniston Donald G. Guetersloh Melvin H. Hallmann	Automatic Belt Tensioner
4,300,114	11-10-81	John J. Sheridan Willis H. Anderson	Manually Adjustable Resistor Device
4,300,890	11-17-81	Melvin M. Hallmann Burr E. Stephens	Automatic Tension Control Mechanism For A Belt Drive
4,306,851	12-22-81	Robert H. Thune	Cam Acting Core Lock And Straightener

1982

4,309,818	1-12-82	Richard H. Kline	Method for Manufacturing a Preformed Flex-Rib Battery Case
4,310,793	1-12-82	Leonard J. Sheldrake Stanley E. Olson Philip A. Karau	Charge/Float Motor Vehicle Electrical System
4,323,744	4-6-82	John J. Sheridan Allen K. Schwartz Willis H. Anderson	Switch for Controlling A Plurality of Light Circuits

<u>Patent No.</u>	<u>Date</u>	<u>Inventor</u>	<u>Title</u>
4,327,163	4-27-82	Ellis G. Wheadon	Half-Envelop Separator Assemblies on Individual Plates
4,328,945	5-11-82	William J. Perkins	Battery Container Mold
4,332,225	6-1-82	Francis G. Cox (Chev) William J. Ricketts	Internal Combustion Engine With Oxygen Sensor Heater Control
4,340,832	7-20-82	Robert A. Cheetham Ralph E. Sears	Dynamoelectric Machine Brush Holder
4,342,292	8-3-82	Ronnalee House Byron W. Johnson	Ignition Distributor
4,342,342	8-3-82	Ellis G. Wheadon	Grooved and Cracked Battery Plate and Process for Coil-Curing Same
4,342,442	8-3-82	William J. Perkins William C. Vest Walter A. Gauuen, III (not DR) Robert E. Meyer (not DR)	Battery Container Mold
4,345,197	8-17-82	Ellis G. Wheadon Robert J. Nowakowski	Vehicle Battery Charging System
4,351,306	9-28-82	James E. Luckman William P. Winstead John L. Kastura (DE)	Electronic Ignition System
4,351,891	9-28-82	Charles P. McCartney, Jr. Ellis G. Wheadon	Lead-Acid Storage Battery Plate and Method of Making Same
4,358,517	11-9-82	Richard A. Jones	Nickel-Zinc Cell
4,358,518	11-9-82	Robert C. Matter	Wrought Lead-Calcium-Strontium-Tin (+Barium) Alloy for Battery Components
4,363,857	12-14-82	Renard E. Mix	Laminated Metal-Plastic Battery Grid
4,364,344	12-21-82	Earl H. Buetemeister	Internal Combustion Engine with Initial Suppression During Cranking

<u>Patent No.</u>	<u>Date</u>	<u>Inventor</u>	<u>Title</u>
4,371,804	02-01-83	Yuchi P. Peng Gerald O. Huntzinger Melvin H. Hallmann	Piezoelectric Knock Sensor
4,376,254	03-08-83	John V. Hellmann	Annular Molded Article Secured to a Shaft
4,376,156	03-08-83	Ellis G. Wheadon(not DR)	Battery Intercell Connector Manifold
4,376,236	03-08-83	Donald A. Long Thomas R. Sowash	Multiple Function Switch Assembly
4,376,237	03-08-83	Donald A. Long	Vehicle Turn Signal Switch Actuator
4,382,242	05-03-83	Jack A. Colvin John V. Hellmann Alan L. Smock(not DR)	Solenoid Operated Electrical Switch
4,384,031	05-17-83	Richard H. Kline	Preformed Flex-Rib Battery Case
4,393,688	07-19-83	Daniel U. Johnston George A. Shinkle	Piezoelectric Knock Sensor
4,394,555	07-19-83	Donald A. Long Thomas R. Sowash	Switch Assembly with Pivoted Actuator
4,395,609	07-26-83	Thomas R. Sowash	Cam Operated Dual Switch Assembly
4,396,691	08-02-83	Ellis G. Wheadon(not DR)	Battery having Separator Sheathed/Supported Plates
4,399,335	08-16-83	Ronnalee House John Delaplane Ronald G. Davis	Switch Actuator Assembly
4,399,379	08-16-83	Stephen W. Marks(not DR) Gary D. Wooten Ronald N. Gray	Air Cooled Machine and Cooling Fan
4,403,019	09-06-83	David T. Poe	Venting System for Electric Storage Battery
4,403,121	09-06-83	Gerald O. Huntzinger Raymond O. Butler, Jr. Lewis R. Hetzler John Delaplane	Remote Control Unit
4,403,579	09-13-83	Robert E. Young Bobbie D. Bridgewater	Internal Combustion Engine Ignition Distributor Drive Arrangement

<u>Patent No.</u>	<u>Date</u>	<u>Inventor</u>	<u>Title</u>
4,409,302	10-11-83	David T. Poe	Venting System for Electric Storage Battery
4,412,457	11-01-83	Jack A. Colvin John M. McClellan	In-line Engine Cranking Motor Drive Having Reduction Gear Set
4,415,812	11-15-83	Donald B. Griffith Timothy C. Alexander	Electric Starting System
4,417,608	11-29-83	Charles P. McCartney, Jr. Ellis G. Wheadon(not DR)	Method of Making a Lead-Acid Storage Battery Plate
4,422,494	12-27-83	William J. Chafin Ben C. Brown	Vibratory Forming of Shaped Lead Joints
4,424,263	1-3-84	Gregory L. Howell Oscar H. Smith Don G. Townsend	Intercell Flame Arrestor for a Battery Venting and Filling Manifold
4,429,365	1-31-84	James E. Luckman John L. Kastura(not DR) Thomas L. Voreis(not DR)	Spark Timing Control System
4,459,489	7-10-84	Thomas E. Kirk Curtis D. Munden Leonard J. Sheldrake	Generator Load Response Control
4,463,069	7-31-84	Michael E. Greenlee	Battery Venting System
4,464,142	8-7-84	David B. Bridges John J. Schulte	Ignition Distributor Shaft Coupler
4,470,338	9-11-84	Kenneth H. Clayton Melvin H. Hallmann Gerald O. Huntzinger Burr E. Stephens	Self Oscillating Vacuum Actuator
4,470,385	9-11-84	John F. Burk Terry A. Spidel	Ignition Distributor
4,471,180	9-11-84	Allen K. Schwartz Billy R. Jones	Multi-Circuit Switch Apparatus
4,476,449	10-9-84	Ronald N. Gray Ronald G. Davis	Switch Actuator for a Remote Control Unit
4,480,166	10-30-84	Howard E. Leech	Resistance Welding of Zinc-Coated Steel

<u>Patent No.</u>	<u>Date</u>	<u>Inventor</u>	<u>Title</u>
4,480,377	11-6-84	Ronnalee House Roger W. Kellams	Method of Making an Ignition Coil Core
4,481,585	11-6-84	Gerald O. Huntzinger Raymond O. Butler, Jr. Lewis R. Hetzler, John Delaplane Anthony L. Marks	System for Selective Controlling Motor Vehicle Electrical Loads
4,481,925	11-13-84	Philip A. Karau Marshall W. Littrell John S. Brooks	Internal Combustion Engine Spark Timing Control Including Peak Combustion Sensor
4,485,796	12-4-84	James A. Boyer	Ignition Distributor Voltage Generator
4,486,516	12-4-84	David T. Poe	Low Silhouette Ventir System for Electric Storage Battery
4,488,770	12-18-84	Hoi Lui (not DR) Benjamin F. Brinn	Screw-Down Post Terminal

<u>PATENT NO.</u>	<u>DATE</u>	<u>INVENTOR</u>	<u>TITLE</u>
4,491,779	1-1-85	Robert W. Campbell Donald O. Ruff	Motor Vehicle Electrical System
4,492,912	1-8-85	Robert J. Nowakowski	Dual Voltage Motor Vehicle Electrical System
4,493,001	1-8-85	Leonard J. Sheldrake	Motor Vehicle Battery Rundown Protection System
4,496,395	1-29-85	John J. Croat	High Coercivity Rare Earth-Iron Magnets
4,502,659	3-5-85	Ronald L. Stephenson Arthur G. Beer	Collet-Containing Mold for Undercut Molding
4,503,365	3-5-85	Thomas E. Kirk	Power Supply System For Low Cold Resistance Loads
4,503,378	3-5-85	Richard A. Jones William D. Reoch	Charging System For Nickel-Zinc Batteries
4,509,125	4-2-85	Gerald T. Fattic William J. Vukovich* *(not DR)	Continuously Variable Transmission Ratio Control System
4,516,066	5-7-85	Robert J. Nowakowski	Dual Voltage Battery Charging System
4,527,986	7-9-85	Bobbie D. Bridgewater Robert E. Young	Resilient Anti-Backlash Shaft Coupling
4,534,091	8-13-85	Richard H. Kline	Battery Grid and Method of Making Same
4,535,040	8-13-85	Richard H. Kline	Battery Grid
4,536,697	8-20-85	Ralph H. Johnston Curtis D. Munden Leonard J. Sheldrake	Vehicle Electrical Energy Management System
4,540,962	9-10-85	Ross A. Gresley Howard E. Leech Alan L. Smock* *(not DR)	Solenoid Coil Wire Termination
4,544,812	10-1-85	Robert C. Buttry James A. Boyer	Ignition Distributor Cap
4,547,236	10-15-85	Charles P. McCartney Jr.	Extruded Compartment- talized Container
4,549,089	10-22-85	Earl H. Buetemeister Larry L. Colville	Engine Cranking Motor Lock Out System
4,551,630	11-5-85	Daniel W. Stahura Daniel D. Richey	Electric Starting System

1986 PATENTS

<u>PATENT NO.</u>	<u>DATE</u>	<u>TITLE</u>	<u>INVENTOR</u>
4,573,364	3-04-86	Gear Reduction Starter Drive	David E. Givan
4,575,593	3-11-86	Electromagnetic Radiation Suppressing Distributor Rotors	Edward Welker Lynn A. Rockwell
4,579,010	4-01-86	Shift Mechanism For Engine Starting Apparatus	Jack A. Colvin Ronald G. Colvill
4,586,245	5-06-86	Solenoid Coil Wire Termination	Ross A. Gresley Howard E. Leech
4,586,467	5-06-86	Electric Starting Apparatus	Louis J. Raver
4,587,183	5-06-86	Extruded Compartmentalized Container	Charles P. McCartney, Jr.
4,588,911	5-13-86	Alternating Current Generator Rotor And Fan	Lowell C. Gold
4,588,915	5-13-86	Alternating Current Generator Rotor	Lowell C. Gold Mark H. Hanshew
4,596,218	6-24-86	LPP Combustion Control For IC Engine With Abnormal Combustion	Philip A. Karau Anthony L. Marks
4,601,197	7-22-86	Peak Combustion Pressure Timing Detector For Internal Combustion Engine	Gerald T. Fattic David S. Dennis William J. Ricketts
4,604,538	8-05-86	Air Cooling For Diode-Rectified Alternating Current Generators	Thomas A. Merrill Donald A. Martin
4,606,000	8-12-86	Bridge Rectifier	Roy B. Steele Thomas E. Kirk Melvin T. Robinson Stephen W. Anderson
4,619,875	10-28-86	Anti-Stratification Battery Separator	Daniel W. Stahura Verl V. Smith, Jr.
4,620,522	11-04-86	Ignition Distributor Voltage Generator	James A. Boyer
4,620,620	11-04-86	Actuator For Adjustable Hydraulic Damper	Daniel U. Johnston Thomas R. Sowash Richard D. Watson
4,620,641	11-04-86	Access Plug For Threaded Holes In Electric Starting Apparatus	Arthur G. Beer
4,625,950	12-02-86	Lead Alloying Apparatus	Jackie L. Tobias Larry R. Kline Ted O. Moser
4,631,685	12-23-86	Method And Apparatus For Ultrasonic Plastic Forming And Joining	David A. Peter

1987 PATENTS

<u>PATENT NO.</u>	<u>DATE</u>	<u>TITLE</u>	<u>INVENTOR(S)</u>
4,636,706	1-13-87	Generator Voltage Regulating System	T. E. Kirk
4,663,979	5-12-87	Solenoid Attachment For Electric Starting Apparatus	R. A. VanSickle
4,673,625	6-16-87	Battery And Handle Therefor	C. P. McCartney, Jr. E. W. Susko J. T. Crouse
4,675,991	6-30-87	Method Of Assembling Electric Storage Batteries	R. G. Byers
4,683,180	7-28-87	Electric Storage Battery	J. R. Bish C. P. McCartney, Jr. C. A. Meadows
4,684,101	8-04-87	Quick Change Mold Insert	E. F. Wagner C. M. Smith
4,684,202	8-04-87	Overmolded Electrical Connection	R. House R. W. Kellams
4,699,764	10-13-87	Method For Alloying Metals Having Significantly Different Melting Points	J. L. Tobias L. R. Kline T. O. Moser
4,706,639	11-17-87	Integrated Direct Ignition Module	J. A. Boyer B. D. Bridgewater
4,707,616	11-17-87	Electric Engine Starter	D. R. Ogle D. D. Richey J. L. Whitehurst
4,710,239	12-01-87	Hot Pressed Permanent Magnet Having High And Low Coercivity Regions	N. A. Schaffel
4,711,156	12-08-87	Actuator For Converting Linear Motion To Rotary Motion And Vice Versa	F. Kayyod R. J. Stuart J. D. Ogden
4,711,157	12-08-87	Actuator For Converting Linear Motion To Rotary Motion And Vice Versa	F. Kayyod R. J. Stuart J. D. Ogden
4,711,158	12-08-87	Linear Motion Actuator With Spring Centering Means	F. Kayyod
4,711,265	12-08-87	Spring And Washer Device	R. G. Davis C. D. Denniston R. K. Van Skyock

1988 PATENTS

<u>PATENT</u>	<u>DATE ISSUED</u>	<u>TITLE</u>	<u>INVENTOR(S)</u>
4,723,105	2-02-88	Dual Voltage Motor Vehicle Electrical System	L. J. Leaf
4,727,279	2-23-88	Piezoelectric Knock Sensor	Y. P. Peng
4,730,097	3-08-88	Dual Mode Windshield Heater Control	R. W. Campbell D. O. Ruff (ret.)
4,731,543	3-15-88	Electric Starting Motor Control System	E. H. Buetemeister (ret.) J. R. Spears
4,731,601	3-15-88	Cranking System Performance Indicator	R. J. Nowakowski V. V. Riesberg, Jr. (ret.) R. P. MacKenzie (ret.)
4,742,611	5-10-88	Battery Assembly Process And Apparatus	C. A. Meadows P. E. Grady
4,743,270	5-10-88	Filling Mat-Immobilized-Electrolyte Batteries	C. P. McCartney, Jr. (ret.) R. L. Galyen
4,743,830	5-10-88	Dual Voltage Electrical System	L. E. Lakey
4,745,675	5-24-88	Method Of Manufacturing Laminations For Electrical Apparatus	S. W. Marks T. G. Seeger
4,746,051	5-24-88	Ultrasonic Welding Control	D. A. Peter
4,748,862	6-07-88	Starter Drive Having A Contaminant Collecting Bushing	R. E. Johnston (ret.)
4,750,511	6-14-88	Fluid Pressure Spool Valve And Method Of Controlling Pressure Forces Acting Thereon	J. P. Henry A. A. Skinner
4,756,982	7-12-88	Dual Seal Battery Vent Valve	C. P. McCartney, Jr. (ret.) C. A. Meadows
4,757,601	7-19-88	Connection Of Tapered Armature Conductor To Tapered Commutator Slot	H. E. Leech T. J. Pahls
4,761,354	8-02-88	Universal Battery Post Cap	D. T. Poe J. T. Crouse

1988 PATENTS

<u>PATENT</u>	<u>DATE ISSUED</u>	<u>TITLE</u>	<u>INVENTOR(S)</u>
4,764,182	8-16-88	Electric Storage Battery	J. R. Bish C. P. McCartney, Jr. (ret.)
4,769,624	9-06-88	Permanent Magnet Assembly	L. J. Eshelman D. E. Merritt (ret.) C. A. Hammer (ret.)
4,770,456	9-13-88	Robotic End Of Arm Tooling Internal Gripper	G. A. Phillips J. L. Mummert
4,778,329	10-18-88	Robot With Floating XY Plane Arm	G. A. Phillips
4,780,226	10-25-88	Lubrication For Hot Working Rare Earth-Transition Metal Alloys	L. E. Sheets N. A. Schaffel
4,780,259	10-25-88	Method Of Securing Metallic Terminal To Thermoplastic Distributor Cap	R. C. Buttry J. A. Boyer
780,378	10-25-88	Battery Vent Valve	C. P. McCartney, Jr. (ret.) C. C. Montgomery C. A. Meadows B. A. Cole
4,780,619	10-25-88	High DC Voltage Power Supply For Motor Vehicle Electrical System	R. W. Campbell D. O. Ruff (ret.)
4,785,214	11-15-88	Brush Rigging For Dynamoelectric Machines	J. L. Mummert
4,790,513	12-13-88	Solenoid Valve Assembly	R. G. Davis D. S. Dennis (ret.) J. S. Hickman (ret.) W. J. Linch (ret.)
4,791,702	12-20-88	Carrying Handle	H. D. McVey

1989 PATENTS

<u>PATENT</u>	<u>TITLE</u>	<u>INVENTOR(S)</u>
4,797,549	Optical Sensor And Method Of Making Same	G.T. Fattic
4,800,142	Electric Storage Battery	J.R. Bish C.P. McCartney, Jr. (ret.) C.A. Meadows
4,802,931	High Energy Product Rare Earth- Iron Magnet Alloys	J.J. Croat
4,803,417	Vehicle Battery Discharge Indicator	R.J. Nowakowski V.V. Riesberg, Jr. (ret.)
4,809,660	Engine Spark Timing Control For Torque Management Of A Motor Vehicle Drivetrain	S.M. Hamade
4,821,770	Solenoid Valve Assembly	R.M. Parrott
4,823,032	End Frame And Stator Assembly For A Dynamoelectric Machine	R.W. Ward W.E. Boys R.G. Hunter (Student-U.of IL)
4,829,163	Crack Detector For Heated Glass Panel	R.A. Rausch D.O. Ruff (ret.)
4,829,228	Dual-Generator Electrical System	E.H. Buetemeister (ret.)
4,829,232	Nonlinear Resonant Switch And Converter	R.W. Erickson, Jr. (U.of CO.)
4,829,277	Isotropic Rare Earth-Iron Field Magnets For Magnetic Resonance	D.W. Stahura
4,830,333	Solenoid Valve	R.D. Watson
4,842,010	Locking Mechanism	R.K. Edgecomb M.T. Rose (ret.)
4,842,656	Anisotropic Neodymium- Iron-Boron Powder With High Coercivity	J.R. Maines D.H. Arnold
4,851,058	High Energy Product Rare Earth- Iron Magnet Alloys	J.J. Croat

4,860,794	Single Ended Solenoid Valve Assembly	R.M. Parrott J.A. Colvin L.W. Shuey
4,861,687	Battery Handle Adapter	R.F. Brantley H.D. McVey
4,862,123	Solenoid For Electric Starters	R.N. Gray (ret.) R.O. Butler, Jr.
4,864,915	Vacuum Operated Actuator	D.U. Johnston (ret.)
4,867,809	Method For Making Flakes Of Re-Fe-B Type Magnetically Aligned Material	J.E. Haverstick
4,881,985	Method For Producing Anisotropic Re-Fe-B Type Magnetically Aligned Material	J.J. Croat
4,883,973	Automotive Electrical System Having A Starter/Generator Induction Machine	L.E. Lakey D.A. Peter D.A. Chance S.W. Anderson