## CLASS 322, ELECTRICITY: SINGLE GENERATOR SYSTEMS

## SECTION I - CLASS DEFINITION

This is the Generic Class for: Single electric energy generators for supplying single load circuits, there being means to regulate or control the generator output, which means may be electrical or nonelectrical and may act in the prime mover for the generator, the power transmission means between the generator prime mover and the generator, the generator, or the armature (output) circuit of the generator, or any combination thereof.

## SECTION II - LINES WITH OTHER CLASSES AND WITHIN THIS CLASS

A. GENERATOR RECITED BY NAME ONLY

Systems as defined in Class Definition, above are included in this class even though the generator is recited by name only if the system includes means for the regulation or control of the generator output. Systems which include a generator recited by name only, no significant characteristics of the generator or its control being claimed, are classified with the system, even though the type of current and/or voltage produced by the generator is recited (i.e., as a 60 cycle generator), the generator being considered only a source of energy for the system. For such excluded systems, see the classes referred to under "Search Class" below.

B. LOAD IN OUTPUT CIRCUIT RECITED BY NAME ONLY OR SIGNIFICANTLY

1. Class 322 provides for single generator supplied single load systems as defined in the Class Definition above not otherwise classified even though the electric load in the output circuit is recited by name only or by its electrical characteristics, the system defined otherwise being drawn to the control of the generator.

2. Systems having significant characteristics of the circuit elements in the load circuit other than or in addition to those for the control or regulation of the generator are classified according to the type of load circuit or load device claimed even though significant generator structure or control is also claimed.

3. The following indicates in more detail the classification lines followed in applying paragraphs 1 and 2 where significant generator regulation or control is claimed in combination with electric load or load circuit features.

a. Generator with Transformer or Inductance only in the Load Circuit:

Where the transformer or inductance is recited by name only, the system is in Class 322. Where significant characteristics of the transformer or transformer circuit are claimed, the system is classified as a transformer system. Merely reciting that the transformer has primary and secondary windings or that the transformer is an auto transformer is not a recitation of significant transformer structure or circuit. A recitation that the transformer is a variable ratio transformer is a recitation of significant transformer structure. Likewise systems having a significant structure of an inductance or inductance circuit are classified according to the type of system formed by the inductance. A recitation that the inductance is variable is a recitation of significant inductance structure. For the systems which provide for systems having transformers and/or inductances therein, see Class 323 referred to under "SEARCH CLASS" below.

b. Generator with Condenser Only in Load Circuit:

Where the condenser is recited by name only, the system is classified in Class 322, except in the following cases:

i. where the system is designed for the specific purpose of charging and discharging the condenser, such a system being classified in Class 320, Battery or Capacitor Charging or Discharging, subclasses 166+.

ii. where the condenser is provided solely to control the characteristics of the load circuit (power factor control regulators) such a system being classified in Class 323 listed under References to Other Classes, below.

iii. or where the condenser is defined by significant condenser structure, such a system being classified in Class 323, Electricity: Power Supply or Regulation Systems, subclass 364.

c. Generator and Resistor Only in Load Circuit:

Where the resistor is recited by name only, the system is classified in Class 322. Where significant characteristics of the resistor or resistor system is claimed, the system is classified as a resistor system. Also merely reciting a variable resistance is not considered to be a recitation of significant resistor or resistor system. If in

the foregoing systems, structure of the resistor is recited, the patent will be excluded from Class 322.

d. Generator and Electric Switch Only in the Load Circuit:

Where the switch is recited by name only, the system is classified in Class 322. Where significant switch structure or switching system is claimed, the patent is excluded from Class 322. Where an overload switch when open includes a resistor in the circuit to limit the generator current flow, the patent is classified in Class 322. Also, a switch in the load circuit to prevent reverse current flow to the generator is classified in Class 322.

e. Generator with frequency changing means and/or phase converting means and/or current converting means and/or phase control means:

Where the generator supplies a load circuit which includes any of the following means, a frequency changing means, a phase converting means, a current converting means, or a phase controlling means, the patent is excluded from Class 322 whether the means in the load circuit is claimed broadly or specifically. For such excluded systems, see the references to Classes 363, Electric Power Conversion Systems, and 323 Electricity: Power Supply or Regulation Systems, under "SEARCH CLASS" below.

f. Generator and Testing Means for Generator, Signal or Indicator for Generator, Recorder for Generator, Measuring Means for Generator:

Where the generator system includes by name only testing means for the generator, a recorder for the generator or measuring means (voltage, frequency, current, etc.) for the generator, the system is classified in Class 322. Class 322 also takes such systems where the system includes a plurality of such means recited by name only. If any significant characteristics of the testing means, signal or indicating means or recorder, or measuring means are recited, the system is classified with the particular means. For the classes which provide for such means, see the classes referred to under "Search Class" below.

g. Battery Charging and Discharging Systems:

This class excludes generator supplied battery charging systems, battery discharging systems, and the combined charging and discharging systems for one or more batteries. Such systems are in Class 320, Electricity: Battery or Capacitor Charging or Discharging. See the reference to Class 320 under "Search Class" below.

h. Generator and Plural Circuit Elements or Means in the Load Circuit:

Where the generator load circuit includes a plurality of circuit elements or means, and one of the circuit elements is a transformer, a frequency changing means, a phase modification means, or a phase regulation means, even though recited by name only, such system is excluded from Class 322. Where the generator load circuit includes a plurality of circuit elements or means, none of which are these recited in the foregoing paragraph, and such elements are recited by name only, and there is no recitation of the manner of connection of the elements to make any particular type of art system (as an impedance regulator), then the system is classified in Class 322. Where the system includes any significant characteristics of any of the plurality of circuit elements or of their connection with respect to each other in the load circuit, the system is classified according to the type system formed by the load circuit elements.

C. POLYPHASE GENERATOR AND LOAD CIRCUIT:

This class includes polyphase generator systems for supplying a single polyphase load circuit where significant generator structure or control is recited and if the polyphase load circuit is not excluded from the class by the limitation of "B. Load In Output Circuit Recited By Name Only Or Significantly" above. A polyphase load circuit including a plurality of single phase load circuits is excluded from Class 322 as being a plural load circuit.

D. PLURAL GENERATORS AND/OR PLURAL LOAD CIRCUITS:

1. Plural Generators:

Systems having a plurality of generators supplying a single load circuit or having a plurality of generators supplying a plurality of load circuits are excluded from Class 322. However, Class 322 does include single generator systems having one or more generators used as the source of excitation for the generator which supplies the single load circuit. See subclasses 59+. For the excluded subject matter, see the classes in References to Other Classes, below.

2. Plural Load Circuits:

Where the patent discloses a generating system and a

plurality of load circuits supplied by a generator, but the plurality of load circuits are not claimed, the patent is included in Class 322. Where significant characteristics of the load circuits are claimed, so that the load circuits do not constitute a single load circuit, the patent is classified in the classes listed in References to Other Classes, below.

E. GENERATING SYSTEMS WITH NONMAGNETIC GENERATOR:

This class provides for generating systems as defined in the Class Definition, above having a nonmagnetic generator which are not otherwise classified. Nonmagnetic generators include: i. Battery generators. ii. Thermoelectric generators. iii. Photoelectric generators. iv. Piezoelectric generators. v. Electrostatic generators. vi. Friction generators. See References to Other Classes, below for these other classes and subclasses which provide for generating systems having a nonmagnetic generator.

F. NONELECTRICAL MEANS CONTROLLING THE GENERATOR:

Systems as defined in the Class Definition, above are included in this class where the only control means for the generator is a nonelectrical means (such as a mechanical or hydraulic system) controlling the operation of the generator prime mover, or the power transmission between the prime mover and the generator.

Where the prime mover is a nonelectric prime mover, see "G. Prime Mover Driven Generator Systems--b. Nonelectric Motor Driven Systems," below. Where the generator control means which controls only the generator structure (such as the generator magnetic structure or the brushes) no other generator control being provided, the subject matter is considered to be only generator structure and is excluded from Class 322. Where the generator control means includes electric means and nonelectric means, the subject matter is considered to be a generator control or regulation system included in Class 322.

G. PRIME MOVER DRIVEN GENERATOR SYSTEMS:

a. Electric Motor Driven Generator Systems:

This class provides for systems as defined in the Class Definition, above wherein the prime mover for the electric generator is an electric motor where significant generator structure or circuit is claimed, except where there is a significant relationship between the characteristics of the input circuit for the motor with relation to the output circuit of the generator so that the generator and its motor prime mover constitutes a translating device in a system for converting electric energy having particular characteristics to electric energy having other characteristics. Such excluded systems are classified in Class 363, Electric Power Conversion Systems. Included in Class 322, in subclasses 10+ are motor generator systems where the generator is used as a motor to start the motor, the motor after the starting period is over, serving as a prime mover for the generator. Motor generator systems where the generator is recited by name only and is only a nominal load for the motor are excluded from Class 322 and are classified in Class 318, Electricity: Motive Power Systems as a motor system. See the reference to Classes 321, 318 and 333 under "Search Class" below.

b. Nonelectric Motor Driven Generator Systems: Electric generating systems having the generator driven by a nonelectric prime mover and where either significant characteristics of the prime mover or significant prime mover control features are set forth are excluded from Class 322, and are classified in Class 290, Prime-Mover Dynamo Plants.

GENERATOR STRUCTURE, PER SE:

This class provides for electrical system as distinguished from the structure of the devices capable of translating nonelectric to electric energy. See "F. Nonelectrical Means Controlling The Generator," above. For the classes which provide for generator structure, per se, see the classes referred to in References to Other Classes, below.

SYSTEMS GENERIC TO MOTORS OR GENERATORS:

Where the system includes a dynamo-electric machine, and the machine is disclosed but not claimed as either an electric motor or and electric generator, the patent is classified in Class 322, if the claimed system is otherwise within the definition of Class 322, and provided that no structure or circuit is claimed that limits the system to being a motor system (in case the machine is disclosed as being a motor. Where the machine is claimed as being either a motor or generator, the patent is classified in Class 322). However, see Class 505, Superconductor Technology: Apparatus, Material, Process, subclasses 150+ for high temperature ($T_c$ 30 K) superconducting devices, and particularly subclasses 166+ for

motors or generators containing high temperature superconductors.

GENERATOR SYSTEMS COMBINED WITH OTHER SYSTEMS:

Where a generating system is part of an art system or other system, it is classified with such art device or other system. For a partial list of the classes that provide for such art systems or other systems, see the classes listed under References To Other Classes below.

## SECTION III - REFERENCES TO OTHER CLASSES

SEE OR SEARCH CLASS:

40, Card, Picture, or Sign Exhibiting, and appropriate subclasses, for generator supplied signs, see subclasses 541+, for illuminated signs.

43, Fishing, Trapping, and Vermin Destroying, subclasses 16 and 17, for generator supplied signaling devices, subclass 42.07, for generator supplied illuminated bait, subclasses 98+, for generator supplied electrocuting trap, subclass 112, for generator supplied electrocuting devices for insects, and subclass 113, for generator supplied illuminated traps for insects, and subclass 27, for generator supplied devices to illuminate artificial and live bait.

47, Plant Husbandry, subclass 1.3, for generator supplied systems of electroculture for plants.

73, Measuring and Testing, and appropriate subclasses, for generator systems used in measuring and testing apparatus. See note 3, C, Electrical, to the class definition of Class 73, for the line between Classes 73 and 322. In Class 73, see subclasses 862+, for dynamometer systems for measuring torque, moments work or power by measuring the force exerted or power exerted by a prime mover for a dynamoelectric generating machine, see indented subclass 862.191 for such systems where the power is measured during transmission.

84, Music, subclasses 600+, for electric musical instruments utilizing an electric generator for electrical tone generation. See subclasses 1.04+, where the generator includes a tuned sound wave generator or resonator (such as tuned reed or string) subclass 1.18 where the instrument includes an electro-optical type (photo-cell) generator, subclasses 1.19+, for the instruments with generators (usually dynamoelectric generators) and means for the selective control of the tone partials, and subclass 1.28 for the instruments with pattern or sound record type generators.

105, Railway Rolling Stock, subclasses 35+, for locomotives in which a prime mover runs an electric generator for generating electricity which supplies current for electric motors to drive the locomotive, and subclasses 49+, for generator supplied electric locomotives, see indented subclasses 50+, for electric locomotives which carry primary or storage batteries for the supply of electricity to the motors or other car devices.

123, Internal-Combustion Engines, subclasses 143+, for generator supplied ignition systems for internal combustion engines; see subclass 148, for the high tension ignition systems including those having a dynamoelectric generator; and subclass 149, for ignition systems having a dynamoelectric generator operated by an engine, the dynamo supplying the ignition current, and for combined dynamo-electric generator and ignitors and for dynamoelectric generators which are especially designed for use with internal combustion engines for supplying the ignition current.

136, Batteries: Thermoelectric and Photoelectric, subclass 89, for structure of photoelectric generators, and see "E. Generating Systems With Nonmagnetic Generator:" above for a reference to battery generators, per se. ("Photoelectric Generators")

136, Batteries: Thermoelectric and Photoelectric, subclasses 200+ for structure of thermoelectro generators. (" Thermoelectric generators")

188, Brakes, subclasses 159+, for brakes operated by means of electric current furnished by the motors, acting as generators.

204, Chemistry: Electrical and Wave Energy, is the generic class for chemical apparatus and systems involving electric and wave energy and including arrangements wherein the source of electric energy is a generator.

219, Electric Heating, for generator supplied heating and welding systems.

236, Automatic Temperature and Humidity Regulation, appropriate subclass 69 for thermocouples used in temperature regulating systems. ("Thermoelectric generators")

246, Railway Switches and Signals, for generator supplied electric railway switch and signal systems; see subclass 245, for car actuated generators, that is, devices by which the energy of the

moving vehicle is converted into electrical energy for actuating switches and/or signals.

250, Radiant Energy, subclasses 200+, for miscellaneous photo cell controlled electric circuits and photocell apparatus, particularly subclass 212 where the photocell is a self-generating type cell (e.g., battery) which supplies electric current to the circuit. ("Photoelectric Generators")

257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 10, 11, 21, 53-56, 72, 80-85, 113-118, 184-189, 225-234, 257-258, 290-294, 414, and 431-466 for light responsive active semiconductor devices. ("Photoelectric Generators")

290, Prime-Mover Dynamo Plants, see section I, J, of the class definition above, for a reference to nonelectric prime mover driven electric generators.

307, Electrical Transmission or Interconnection Systems, subclasses 11+ for systems wherein one or more generators are interconnected with two or more load circuits, and subclasses 43+ for systems wherein two or more generators supply an electrical system.

310, Electrical Generator or Motor Structure, subclass 306 for pyromagnetic electric generators and generation systems. (" Thermoelectric generators")

310, Electrical Generator or Motor Structure, subclasses 311+ for piezoelectric generators and generation systems. ("Piezoelectric Generators")

310, Electrical Generator or Motor Structure, subclass 309 for electrostatic generators. ("Electro-state generators")

310, Electrical Generator or Motor Structure, subclass 310 for friction generators. ("Friction Generators)

314, Electric Lamp and Discharge Devices: Consumable Electrodes, appropriate subclasses, for generator supplied consumable electrode devices (arc lamps, arc welding, electrodes, etc.).

315, Electric Lamp and Discharge Devices: Systems, subclass 55 for electric lamps and electrical space discharge devices (radio tubes) which have a piezoelectric device structurally combined therewith so as to form a unitary device. ( "Piezoelectric Generators")

315, Electric Lamp and Discharge Devices: Systems, and the classes and subclasses specified in the notes to the definition of that class, for generator supplied electric lamps and electric space discharge devices. See subclass 33, for the portable self-contained systems in class 315; subclass 55 for lamps and electric space discharge devices having an electric current generator combined therewith to form a self-contained unit; subclass 78, for class 315 systems having the electric current generator driven by a vehicle motor or driven in response to the motion of a vehicle; and subclass 302, for regulating systems within class 315, where the system includes means to control the current generator.

318, Electricity: Motive Power Systems, for generator supplied motor systems. See section J of the class definition above for motor driven generator systems. See section III of the class definition of Class 322 for the line between Classes 318 and 322 with respect to systems having a dynamoelectric machine where the machine is disclosed as a motor, but is not claimed as a motor and where the claimed system is generic to either a motor or generator.

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclass for a generator-supplied battery charging system (See section I, D, 3, g, and I, G, of this class definition for the line between Classes 320 and 322 with respect to a generator-supplied battery load); and subclasses 166+ for a generator-supplied capacitor charging circuit (See "Load In Output Circuit Recited By Name Only Or Significantly:--Generator with Condenser Only in Load Circuit" above for the line between Classes 320 and 322 with respect to a generator supplying a load capacitor.)

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclass for a battery charging either another battery or a capacitor, or for a generator-supplied battery charging system. ( "Battery charging or discharging")

323, Electricity: Power Supply or Regulation Systems, for miscellaneous voltage magnitude controlled systems and miscellaneous phase controlled systems.

324, Electricity: Measuring and Testing, appropriate subclasses, for testing apparatus having electric generators for supplying the electric current for the testing, electric systems for testing the characteristics of electric generators (see "Load In Output Circuit Recited By Name Only Or Significantly:--Generator Testing Means for Generator, Signal, etc." above for a statement of the general line between Classes

324 and 322 for generator systems provided with a testing means), and testing apparatus using electric generator systems for indicating some characteristic of the device being tested (such as speed).

331, Oscillators, subclass 73 for crystal oscillators of the electron-coupled type, subclass 139 for crystal oscillators of the bridge type, subclass 155 for oscillators wherein a piezoelectric crystal drives or is driven by the electro-mechanical frequency determining resonator of the oscillator and subclass 158 for crystal oscillators in general. ( "Piezoelectric Generators")

331, Oscillators, subclass 71 for oscillation generating systems wherein a generator of raw A.C. may be employed as source of power or bias for the oscillator, and subclasses 185+ for oscillation generating systems having a particular source of power or bias voltage, which source may be a generator of the type classified in Class 322.

333, Wave Transmission Lines and Networks, subclasses 148+ for delay networks of the electromechanical transducer type, which may include a piezoelectric device, and wherein the mechanical coupling between the motor and the generator determines the delay characteristics of the network, and subclasses 187+ for wave filters of the piezoelectric type. ("Piezoelectric Generators")

333, Wave Transmission Lines and Networks, subclasses 148+ for delay networks of the electromechanical type, subclasses 167+ for wave filter networks, particularly subclasses 186+ for wave filters of the electromechanical type, wherein the mechanical coupling between the motor and the generator determines the propagation characteristic of the filter.

340, Communications: Electrical, appropriate subclasses, for generator systems having an electric signal or indicator; see "Load In Output Circuit Recited By Name Only Or Significantly:--Generator Testing Means for Generator, Signal, etc." above for the general line between Class 322 and Class 340 with respect to such systems. See "Generating Systems With Nonmagentic Generator" of the class definition of Class 322 for a reference to the nonelectromagnetic induction generators in Class 340.

340, Communications: Electrical, subclass 10 for piezoelectric devices used in submarine signaling. ( "Piezoelectric Generators")

361, Electricity: Electrical Systems and Devices, subclasses 139+ for relay systems, subclasses 236+ for speed-controlled systems which include an electric current generator system, and subclasses 247+ for igniting systems having electric generators for supplying the igniting device.

361, Electricity: Electrical Systems and Devices, subclasses 271+ for condenser structure. ("Electro-state generators")

362, Illumination, subclass 193 for bicycle driven generators for supplying a lamp; subclasses 157+ for miscellaneous portable self-contained electric lamps (flashlights).

363, Electric Power Conversion Systems, appropriate subclasses for conversion systems which may be supplied by a generator. subclasses 102+ for dynamoelectric machine current converter systems wherein the converter might be a motor-generator set or an analogous machine; subclass 150 for dynamoelectric phase converter systems; subclasses 174+ for dynamoelectric machine frequency converter systems, particularly subclass 175 wherein the converter comprises a motor-generator set.

369, Dynamic Information Storage or Retrieval, subclass 144 for a piezoelectric phonograph pickup; and subclasses 146+ for an electromagnetic phonograph pickup.

373, Industrial Electric Heating Furnaces, and appropriate subclasses, for electric generator supplied furnaces, note especially subclasses 102+, for arc furnace control systems, and subclasses 135+, for resistance furnace control systems.

374, Thermal Measuring and Testing, subclasses 179+ for a temperature measuring system having a thermoelectric sensor. ("Thermoelectric generators")

376, Induced Nuclear Reactions: Processes, Systems, and Elements, appropriate subclasses for nuclear reactors, per se, which may be combined with electric generator systems of this class (322). For the line between Class 376 and the energy generating classes see the class definition of Class 376 under II (1) and (2a).

379, Telephonic Communications, appropriate subclasses for a telephone device or system with power source detail, subclass 371 for magneto signalling in a telephone system.

381, Electrical Audio Signal Processing Systems and Devices, subclass 173 for piezoelectric microphones and subclass 190 for a piezoelectric speaker. ( "Piezoelectric Generators")

381, Electrical Audio Signal Processing Systems and Devices, subclass 177 for a moving coil microphone structure.

416, Fluid Reaction Surfaces (i.e., Impellers), appropriate subclasses for a generator system combined with significant impeller structure.

441, Buoys, Rafts, and Aquatic Devices, subclasses 1+ for generator supplied buoys; and subclasses 13+ for illuminated buoys.

455, Telecommunications, subclass 95 for generator supplied portable radio transmitters and receivers; and see subclass 351 for portable self-contained receivers.

505, Superconductor Technology: Apparatus, Material, Process, subclasses 150+ for high temperature ($T_c$ 30 K) superconducting devices, and particularly subclasses 166+ for motors or generators containing high temperature superconductors.

607, Surgery: Light, Thermal, and Electrical Application, appropriate subclasses, especially subclass 1, electric generator supplied surgical apparatus, also for chairs and seats combined with an electric generator (rocking of the chair used to operate dynamoelectric generator), subclass 149 for devices to be worn on the person, as belts, bands, etc., which include an electric generator (usually a battery), and subclasses 115+ for portable self contained medical apparatus for applying electric energy to the body and including an electric generator.

## SECTION IV - GLOSSARY

ELECTRIC ENERGY GENERATORS

As used herein are devices and apparatus for converting any character of nonelectric energy to electric energy.

ELECTRIC GENERATING

As used herein involves the conversion of any character of nonelectric energy to electric energy.

LOAD CIRCUIT

Includes the system into which the electric energy from the electric generator is supplied, and may include a load device recited broadly or by name only (such as a welding load) in some cases. See Lines With Other Classes and Within This Class, above.

SUBCLASSES

**1** This subclass is indented under the class definition. Subject matter wherein the system is modified to produce an arrangement which is peculiarly adapted to be mounted on a movable device.

(1) Note. The mere fact that a generating system is made so light and small that it may be readily carried does not put the system in this subclass. Some modification of the system to the movable device is necessary.

SEE OR SEARCH CLASS:

40, Card, Picture, or Sign Exhibiting, appropriate subclasses, for portable generator supplied self-contained signs, see subclasses 541+, for illuminated signs.

43, Fishing, Trapping, and Vermin Destroying, subclass 16, 17 for portable, generator supplied illuminated signaling devices for fishing apparatus, subclass 17.6 for portable supplied illuminated bait, and subclass 17.5, for portable, generator supplied bait illuminators.

105, Railway Rolling Stock, subclasses 35+ and 49+, for generator supplied locomotives. See subclass 35, for such locomotives in which a prime mover runs an electric generator which supplies current to the electric motors for driving the generator.

123, Internal-Combustion Engines, subclasses 143+, for generator supplied ignition systems for internal combustion engines.

310, Electrical Generator or Motor Structure, subclass 50 for portable or hand held dynamoelectric machines.

315, Electric Lamp and Discharging Devices: Systems, subclass 33 for miscellaneous portable self-contained generator supplied lamp and electric space discharging devices lamps and electric space discharging devices which have an electric generator structurally combined therewith so as to form a unitary device.

361, Electricity: Electrical Systems and Devices, subclass 262 for portable self-contained electric igniting devices such as cigar lighters.

362, Illumination, appropriate subclasses for articles, such as firearms, canes, etc., which include an electric lamp and the source of potential therefor to make a portable self-contained illuminated article; subclass 193 for bicycle driven generators for supplying a lamp; and subclasses 157+ for portable self-contained electric lamp, such as flashlights.

441, Buoys, Rafts, and Aquatic Devices, subclasses 13+ for illuminated buoys.

455, Telecommunications, subclass 351 for portable radio receivers.

607, Surgery: Light, Thermal and Electrical Application, subclass 149 for electrosurgical devices to be worn on the person, as belts, bands, etc., which include an electric generator (usually a battery) and subclasses 115+ for portable self-contained medical apparatus for applying electric energy to the body and including an electric generator.

**2** This subclass is indented under the class definition. Subject matter wherein the generation of electric energy does not involve electromagnetic induction.

(1) Note. See the class definition, Lines With Other Classes, "Generating Systems With nonmagnetic Generator" for a statement as to the type of systems included in this subclass.

**3** This subclass is indented under the class definition. Subject matter wherein the generator has a moving generating means which may be either the armature or field structure which has a reciprocating motion.

(1) Note. The motion may be either rectilinear or curvilinear.

SEE OR SEARCH CLASS:

310, Electrical Generator or Motor Structure, subclasses 15+ for reciprocating generator structure, and subclasses 36+ for oscillating generator structure.

318, Electricity: Motive Power Systems, subclasses 119+, for reciprocating or oscillating type of motor systems.

335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, subclasses 255+ for electromagnets with reciprocating armature.

**4** This subclass is indented under the class definition. Subject matter wherein the generator is provided with a flywheel or depends on the use of a massive moving element to give the moving element a high inertia characteristic.

(1) Note. The usual purpose of the arrangements of this subclass is to minimize minor deviations of the speed of the moving element from its average value.

SEE OR SEARCH CLASS:

74, Machine Element or Mechanism, subclass 572.1, for flywheel structure.

318, Electricity: Motive Power Systems, subclass 150 for generator fed motor systems with flywheel on generator or motor and subclass 161 for motors having flywheels or other massive rotary members.

**5** This subclass is indented under the class definition. Subject matter wherein the polarity of the output voltage of the generator is controlled.

(1) Note. The control may be either to maintain a predetermined polarity of the output voltage or to reverse the polarity of the output voltage.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclass 140, for generator polarity control in generator fed motor systems.

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclass especially subclass 165 and Dig. 15 for polarity monitoring or control in a battery or capacitor charging or discharging system.

**6** This subclass is indented under subclass 5. Subject matter wherein the generator polarity is controlled by controlling the generator excitation.

(1) Note. Such excitation control may take the form of: a. Reversal of field current. b. Changing the relative strengths of opposed field windings. c. Alternate energization of opposed field windings.

**7** This subclass is indented under the class definition. Subject matter wherein both the generator and the load circuit (armature circuit) are controlled.

(1) Note. For a statement of the generator and load circuit control systems included and excluded from this class, see the class definition, especially Lines With Other Classes, "Load in Output Circuit Recited by Name Only etc."

SEE OR SEARCH THIS CLASS, SUBCLASS:

45, for systems within the class definition where the generator is provided with a plurality of diverse generator control means (i.e., control for the armature and fields).

89, for systems within the class definition where the generator control includes means to control the armature or primary circuit of the generator.

**8** This subclass is indented under subclass 7. Subject matter wherein the load circuit control includes load circuit making and breaking.

SEE OR SEARCH CLASS:

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclass for voltage regulation or circuit making or breaking in a battery or capacitor charging or discharging system.

**9** This subclass is indented under the class definition. Subject matter wherein the generator is driven by two or more driving means.

(1) Note. Where one of the driving means is a nonelectric prime mover and the characteristics of the prime mover are significant or the prime mover control is set forth, the subject matter is to be found in Class 290, regardless of the characteristics or operation of the other driving means. See Lines With Other Classes, "Prime Mover Driven Generator Systems" of the class definition for a statement of the general line with Class 290.

(2) Note. See Lines With Other Classes, "Nonelectrical Means Controlling the Generator" of the class definition for a reference to the nonelectric generator control systems for electric generators and/or the generator driving means included in this class.

SEE OR SEARCH THIS CLASS, SUBCLASS:

14+, for systems within the class definition having combined control of the generator and the driving means.

17+, for systems within the class definition having automatic control of the generator or driving means.

38+, for systems within the class definition having driving means control.

SEE OR SEARCH CLASS:

290, Prime Mover Dynamo Plants, see Note (1) above.

**10** This subclass is indented under the class definition. Subject matter wherein means are provided for starting and/or stopping the generator. This involves the physical starting and putting the machine into service or taking it out of service and stopping it.

SEE OR SEARCH CLASS:

192, Clutches and Power-Stop Control, appropriate subclasses, for clutches, subclasses 3.21+, for a combination of vortex-flow drive and clutch, subclasses 3.5+, for miscellaneous mechanism for the joint control of a transmission mechanism and a clutch, subclasses 226 for the joint control of transmission connection and braking mechanism, subclasses 12+, for mechanism for applying a clutch and brake alternately to drive and retard or stop a mechanism, subclasses 116.5+,

for miscellaneous mechanism, usually automatic, for stopping a machine.

290, Prime-Mover Dynamo Plants, subclasses 34+ and subclasses 40+, for nonelectric prime mover driven generator plants having means for physically starting and/or stopping the generator.

307, Electrical Transmission or Interconnection Systems, subclasses 85+ for interconnection systems having means for connecting or disconnecting a plurality of electrical generators.

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclass for a battery or capacitor charging or discharging system that employs a generator.

477, Interrelated Power Delivery Controls, Including Engine Control, for joint control of a motor and a transmission, clutch, or brake.

**11** This subclass is indented under subclass 10. Subject matter wherein the starting or stopping of the generator is initiated automatically in response to predetermined conditions. Sensing means is provided which is responsive to the condition or conditions and initiates the activity of either starting or stopping.

SEE OR SEARCH THIS CLASS, SUBCLASS:

17, for systems within the class definition having automatic control of the generator or driving means.

SEE OR SEARCH CLASS:

290, Prime-Mover Dynamo Plants, subclasses 40+, for nonelectric prime mover driven generator plants having automatic means for physical starting and/or stopping of the generator.

310, Electrical Generator or Motor Structure, subclasses 86+ for systems wherein a generator is started and connected in circuit with other generators in response to a condition, such as load demand.

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclass for a battery or capacitor charging or discharging system that employs a generator.

**12** This subclass is indented under subclass 10. Subject matter wherein a clutching means between the generator and driving means is provided for connecting or completely disconnecting the drive connection.

SEE OR SEARCH THIS CLASS, SUBCLASS:

40+, which relates to arrangements for controlling a generator by controlling the power transmitting mechanism including slip clutches (e.g., magnetic) which do not completely disconnect.

SEE OR SEARCH CLASS:

192, Clutches and Power-Stop Control, subclasses .03 through .098 for mechanism for joint control of a nonelectric motor and clutch, subclass .02 where the motor is electric, and subclasses 30+ for mechanical clutches.

310, Electrical Generator or Motor Structure, subclasses 92+ for magnetic clutches.

**13** This subclass is indented under subclass 10. Subject matter wherein the driving means for the generator is an electric motor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

39, for miscellaneous systems within the class definition having driving means control for an electric motor driving a generator.

SEE OR SEARCH CLASS:

310, Electrical Generator or Motor Structure, subclass 113 for structurally united motor generator sets.

318, Electricity: Motive Power Systems, subclasses 430 through 558 for electric motor starting and/or stopping systems.

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclass for a battery or capacitor charging or discharging system that employs a generator.

**14** This subclass is indented under the class definition. Subject matter wherein the system is provided with controls for both the generator and the driving means.

(1) Note. See the class definition, especially Lines With Other Classes, "Prime Mover Driven Generator Systems--a. Electric Motor Driven Generator Systems" for a statement of the motor generator systems included and excluded from Class 322.

(2) Note. See Lines With Other Classes, "Nonelectrical Means Controlling the Generator" of the class definition for a reference to the nonelectric control means for electric generator and/or the generator driving means included in this class.

SEE OR SEARCH THIS CLASS, SUBCLASS:

10+, for systems within the class definition having means for the physical starting and/or stopping of the generator.

17+, for systems within the class definition having automatic control of the generator or the driving means.

38+, for miscellaneous systems within the class definition having driving means control.

44+, for miscellaneous systems within the class definition having generator control.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclasses 140+, for generator fed motor systems having generator control wherein the generator control includes generator and driving means control.

**15** This subclass is indented under subclass 14. Subject matter wherein the control of the generator and the driving means is performed simultaneously.

(1) Note. Usually a single handle or other operating device operates both control devices.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclasses 140+, for generator fed motor systems having generator control wherein the generator control includes simultaneous generator and driving means control.

**16** This subclass is indented under subclass 15. Subject matter wherein the generator driving means is an electric motor.

(1) Note. See the class definition, especially Lines With Other Classes, "Prime Mover Driven Generator Systems--a. Electric Motor Driven Generator Systems" for a statement as to the electric motor driven generator systems included and excluded from Class 322.

SEE OR SEARCH THIS CLASS, SUBCLASS:

13, for systems under the class definition having means for the physical starting and/or stopping of the generator where the driving means for the generator is an electric motor.

39, for miscellaneous systems within the class definition having an electric motor for driving the generator.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclasses 140+, for generator fed motor systems wherein the generator control includes simultaneous generator and electric motor driving means control.

**17** This subclass is indented under the class definition. Subject matter wherein the generator or driving means are provided with automatic means so that either is controlled in response to predetermined conditions. Sensing means are provided which are responsive to the condition or conditions to effectuate the control.

SEE OR SEARCH THIS CLASS, SUBCLASS:

11, for automatic starting and/or stopping of the generator in response to predetermined conditions.

38, for miscellaneous systems within the class definition having driving means control.

44, for miscellaneous systems within the class definition having generator control.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclasses 141+, for generator fed motor systems having automatic generator control.

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclass for a battery or capacitor charging or discharging system with automatic regulation.

323, Electricity: Power Supply or Regulation Systems, for miscellaneous voltage and phase control systems.

330, Amplifiers, appropriate subclasses, for amplifier systems, generally, including those which may be used in the automatic control of generators, particularly subclass 58 in the amplifier systems of which the active element is a rotating dynamoelectric machine.

**18** This subclass is indented under subclass 17. Subject matter wherein the automatic response means includes a time delay means to delay the response.

(1) Note. The purpose of such arrangement is to prevent unnecessary operation of the control device in response to temporary short time deviations from the controlled condition.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclasses 142+, for generator fed motor systems with control of the generator responsive to predetermined conditions with time delay in the response.

320, Electricity: Battery or Capacitor Charging or Discharging, especially subclasses 155+ for a battery or capacitor charging or discharging system with time control.

**19** This subclass is indented under subclass 17. Subject matter wherein the automatic control means include (1) means responsive to the rate of change of a condition are provided for modifying the response of a control device or (2) means are provided for minimizing or eliminating the tendency of a control device to hunt.

(1) Note. In most cases anti-hunt devices are responsive to rate of change and most rate of change responsive devices are used for anti-hunt purposes. However, the two devices may have other applications.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclasses 141+ for generator fed motor systems having generator control including antihunt or rate of change, response, and subclasses 611+, for electric motor position servomechanisms.

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclass for a battery or capacitor charging or discharging system with automatic control responsive to a rate of change of condition.

333, Wave Transmission Lines and Networks, subclass 19 for differentiating or integrating networks of the passive type.

**20** This subclass is indented under subclass 17. Subject matter wherein the automatic control means include means responsive to the power factor of the load circuit of the generator or phase relationships therein.

SEE OR SEARCH CLASS:

323, Electricity: Power Supply or Regulation Systems, subclasses 205 through 219 for power factor and phase control systems.

**21** This subclass is indented under subclass 17. Subject matter wherein the control arrangement includes line drop compensation means.

(1) Note. The line drop compensation means usually includes an electrical equivalent of the load circuit so that the

current and voltage drops may be duplicated therein.

(2) Note. The control of this subclass permits control of the generator and/or its driving means to maintain a predetermined condition at a point in the load circuit removed from the generator.

SEE OR SEARCH THIS CLASS, SUBCLASS:

25, for systems within the definition of subclass 17 having the automatic control means of other than the line drop compensation type responsive to current and voltage.

SEE OR SEARCH CLASS:

307, Electrical Transmission or Interconnection Systems, subclass 103 for line drop compensation systems, per se.

**22** This subclass is indented under subclass 17. Subject matter wherein the automatic control means are responsive to two or more conditions.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclasses 452+ for plural condition responsive electric motor systems.

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclass for a battery or capacitor charging or discharging system with automatic control responsive to plural conditions.

323, Electricity: Power Supply or Regulation Systems, subclasses 234 through 303, for automatic control of impedance systems in response to plural conditions.

**23** This subclass is indented under subclass 22. Subject matter wherein the plural conditions to which the automatic control means are responsive include an electrical condition.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclasses 453+, for electric motor systems responsive to plural conditions including an electrical condition.

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclass for a battery or capacitor charging or discharging system with automatic control responsive to plural conditions which include an electrical condition.

323, Electricity: Power Supply or Regulation Systems, subclasses 234 through 303 , for automatic impedance control systems responsive to plural conditions including an electrical condition.

**24** This subclass is indented under subclass 23. Subject matter wherein the plural conditions to which the automatic control means are responsive are electrical conditions.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclasses 454+, for electric motor systems responsive to plural electrical conditions and subclass 143 for generator fed motor systems having generator control responsive to plural conditions.

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclass for a battery or capacitor charging or discharging system with automatic control responsive to plural conditions.

323, Electricity: Power Supply or Regulation Systems, subclasses 234 through 303, for impedance systems responsive to plural electrical conditions.

**25** This subclass is indented under subclass 24. Subject matter wherein the plural electrical conditions to which the automatic control means are responsive are current and voltage.

(1) Note. This subclass includes subject matter where the plural conditions to which the automatic control means is responsive is the product of current and voltage (power).

SEE OR SEARCH THIS CLASS, SUBCLASS:

20, for subject matter under subclass 17 where the automatic control means is responsive to the product of voltage,

current and the cosine of the included angle.

21, for voltage and current responsive line drop compensation systems for generator systems.

27, for subject matter under subclass 17 where the automatic control means is controlled in response to the generator current out-put. Where the generator voltage is substantially constant, this may be considered to be a power response.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclass 143 for generator fed motor systems having generator control responsive to voltage and current and subclass 455 for electric motor systems responsive to voltage and current.

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclass for a battery or capacitor charging or discharging system with automatic control responsive to voltage and current conditions.

323, Electricity: Power Supply or Regulation Systems, subclasses 234 through 303, for automatic impedance systems responsive to voltage and current.

**26** This subclass is indented under subclass 17. Subject matter wherein the automatic control means is responsive to light or utilizes a photosensitive circuit.

SEE OR SEARCH CLASS:

250, Radiant Energy, subclasses 200+, and the classes and subclasses specified in the Notes to the definition of these subclasses for photocell controlled circuits and photocell apparatus.

323, Electricity: Power Supply or Regulation Systems, subclasses 221 through 902, for light responsive electric space discharge device voltage magnitude control systems.

**27** This subclass is indented under subclass 17. Subject matter wherein the automatic control means is responsive to generator current output.

(1) Note. Where the generator voltage is substantially constant this may be considered to be a power response. For actual power output response (e.g., voltage and current product or the product of voltage, current and cosine of included angle), search this class, subclasses 20 and 25.

SEE OR SEARCH THIS CLASS, SUBCLASS:

20, for automatic control in response to phase relationships. See Note 1 above.

25, for automatic control in response to voltage and current. See Note 1 above.

SEE OR SEARCH CLASS:

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclass for a battery or capacitor charging or discharging system with automatic control responsive to a current condition.

323, Electricity: Power Supply or Regulation Systems, subclasses 220 through 354, for constant current systems.

**28** This subclass is indented under subclass 17. Subject matter wherein the automatic control means is controlled in response to the generator output voltage or the voltage of the circuit supplied by the generator.

SEE OR SEARCH THIS CLASS, SUBCLASS:

21, for generator systems under subclass 17 wherein the control arrangement includes line drop compensation means (i.e., usually an electrical equivalent of the load circuit so that the current and voltage drops may be duplicated therein) so as to permit control of the generator system to maintain a predetermined condition at a point in the load circuit remote from the generator.

25, and the subclasses specified in the notes to the definition of that subclass for generator systems under subclass 17 having the automatic control

means responsive to current and voltage.

SEE OR SEARCH CLASS:
320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclass for a battery or capacitor charging or discharging system with automatic control responsive to a voltage condition.
323, Electricity: Power Supply or Regulation Systems, subclasses 220 through 354, for constant voltage systems.

**29** This subclass is indented under subclass 17. Subject matter wherein the automatic control of the generator is in response to the speed or frequency of the generator.

SEE OR SEARCH CLASS:
307, Electrical Transmission or Interconnection Systems, subclass 87 for systems for the interconnection of plural generators upon attainment of a predetermined frequency condition.
324, Electricity: Measuring and Testing, subclasses 160+ for speed measuring, and subclasses 76.39+ for frequency measuring.
320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclass for source regulation in a battery or capacitor charging or discharging system.
361, Electricity: Electrical Systems and Devices, subclasses 236+ for speed responsive systems.
388, Electricity: Motor Control Systems, art collections 924+ for running-speed control systems including a feedback device responsive to the speed of the motor.

**30** This subclass is indented under subclass 29. Subject matter wherein the speed or frequency responsive device includes a centrifugal or flyweight governor.

SEE OR SEARCH CLASS:
73, Measuring and Testing, subclasses 488+ for a speed responsive device, per se.
200, Electricity: Circuit Makers and Breakers, subclass 80 for centrifugal switches.
388, Electricity: Motor Control Systems, art collections 924+ for running-speed control systems including a centrifugal feedback device responsive to the speed of the motor.

**31** This subclass is indented under subclass 29. Subject matter wherein a tachometer device is utilized to produce an energy output which is a measure of the speed and such output is used to provide the control.

(1) Note. Although the tachometer device is in most cases an electric generator whose output voltage or frequency is proportional to the speed, other devices are also used (e.g., pumps etc.).

SEE OR SEARCH CLASS:
310, Electrical Generator or Motor Structure, appropriate subclasses for tachometer generators, per se.
324, Electricity: Measuring and Testing, subclasses 160+ for speed measuring systems using a tachometer generator.
361, Electricity: Electrical Systems and Devices, subclasses 236+ for speed responsive systems using a tachometer generator.
388, Electricity: Motor Control Systems, subclasses 800+ for running-speed control systems including a feedback device responsive to the speed of the motor.

**32** This subclass is indented under subclass 29. Subject matter wherein a frequency responsive device or network is utilized to produce a control dependent on the speed of frequency for controlling the generator or driving means.

(1) Note. The frequency responsive device or network may take such diverse forms as a synchronous motor, a frequency meter or a tuned circuit.

SEE OR SEARCH CLASS:
324, Electricity: Measuring and Testing, subclasses 76.39+ for electric frequency measuring.

331, Oscillators, subclasses 1+ for electrical oscillation generating systems having a phase or frequency sensing means for automatically stabilizing the frequency of the generated oscillations.

388, Electricity: Motor Control Systems, subclasses 800+, especially 805, 814 and 820 for running-speed control systems including frequency responsive feedback devices or networks.

**33** This subclass is indented under subclass 17. Subject matter wherein the automatic control of the generator or driving means is in response to temperature or thermal conditions.

SEE OR SEARCH THIS CLASS, SUBCLASS:

2, for systems within the class definition which have a thermoelectric generator.

SEE OR SEARCH CLASS:

136, Batteries: Thermoelectric and Photoelectric, subclasses 4+ for the structure of thermoelectric generators.

318, Electricity: Motive Power Systems, subclasses 471+ for thermally responsive motor control.

320, Electricity: Battery or Capacitor Charging or Discharging, subclasses 150+ for battery charging with detection of a thermal condition.

323, Electricity: Power Supply or Regulation Systems, subclass 369, for thermal responsive impedance systems in general.

324, Electricity: Measuring and Testing, subclasses 92, 104 and 106 for thermally actuated electric meters.

337, Electricity: Electrothermally or Thermally Actuated Switches, appropriate subclasses for electrothermally and thermally actuated switches.

340, Communications: Electrical, subclasses 584+ for electric signaling systems automatically responsive to temperature.

374, Thermal Measuring and Testing, subclasses 179+ for a thermoelectric sensor in a temperature measuring system.

388, Electricity: Motor Control Systems, art collection 934 for running-speed control systems including a feedback device responsive to a thermal condition.

**34** This subclass is indented under subclass 33. Subject matter wherein the thermal condition or conditions to which the control is responsive exists in the generator and/or driving means.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclass 473 for motor control responsive to thermal conditions of the motor.

**35** This subclass is indented under subclass 17. Subject matter wherein the generator or driving means is automatically controlled in response to fluid pressure.

(1) Note. The fluid pressure may be wind pressure.

(2) Note. Where fluid pressure is varied in response to some other condition, the other condition should be searched. For example, a generator system controlled by means of a voltage responsive hydraulic arrangement should be searched in subclass 28.

SEE OR SEARCH THIS CLASS, SUBCLASS:

28, see note 1 above.

SEE OR SEARCH CLASS:

388, Electricity: Motor Control Systems, art collections 929+ for running-speed or acceleration control systems including a feedback device responsive to fluid pressure.

**36** This subclass is indented under subclass 17. Subject matter wherein the automatic control arrangement includes means for setting up a reference standard with means for comparing the condition to be controlled with the reference standard. The control system is usually responsive to the difference between the reference standard and the condition.

(1) Note. The particular condition set up by the standard is not material in this subclass. If the particular condition (e.g., voltage, frequency, etc.) is significant, the preceding subclasses under subclass 17 relating to the particular condition should be searched.

SEE OR SEARCH THIS CLASS, SUBCLASS:

37, for systems under subclass 17 having the automatic control means controlled in accordance with electrical conditions in a circuit other than the circuit in which the generator is connected.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclasses 449+, for electric motor control having automatic control with respect to a standard, master or reference device.

**37** This subclass is indented under subclass 17. Subject matter wherein the generator or driving means is controlled in accordance with electrical conditions in a circuit other than that in which the generator is connected.

(1) Note. In most cases the generator is a control element which controls some device which is connected to the circuit: (e.g., the generator may be an exciter controlled in accordance with the output voltage of a main generator or the generator may be an amplifier device for controlling a motor in accordance with its load).

SEE OR SEARCH THIS CLASS, SUBCLASS:

36, for generator systems under subclass 17 wherein the automatic control arrangement includes means for setting up a reference standard with means for comparing the condition to be controlled with the reference standard.

59+, for exciter generator control.

78, for generator control wherein a generator provides an auxiliary electromotive force in the field circuit of a main generator.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclass 530, for motor field circuit control having plural sources wherein a generator is one of the sources and is controlled in accordance with an electrical condition of the motor and 521+ for exciter generator control of a motor field circuit.

**38** This subclass is indented under the class definition. Subject matter wherein the generator driving means is controlled to control the system.

(1) Note. See Lines With Other Classes, "Nonelectrical Means Controlling the Generator" of the class definition for a reference to the nonelectrical control means for the generator driving means included in this class.

SEE OR SEARCH THIS CLASS, SUBCLASS:

9, for generator systems within the class definition having a plurality of driving means.

10+, for generator systems within the class definition having means to control the generator driving means for starting and/or stopping the generator (putting the generator into and/or out of service).

14+, for this subject matter wherein the system is provided with controls for both the generator and the driving means.

17+, for this subject matter where the system includes automatic control of the driving means.

SEE OR SEARCH CLASS:

315, Electric Lamp and Discharge Devices: Systems, for prime mover driven generator supplied electric lamp and gas or vapor discharge systems, the system including control means for the prime mover.

**39** This subclass is indented under subclass 38. Subject matter wherein the generator is driven by an electric motor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

9, for generator systems within the class definition which have the generator driven by a plurality of electric motors.

16, for this subject matter where the system includes controls for both the electric motor and the generator.

SEE OR SEARCH CLASS:

363, Electric Power Conversion Systems, subclasses 102+, 150, and 174+ for dynamoelectric machine converter systems which may have electric motor driving means control or its equivalent. For the electric motor driven generator systems which are considered to be conversion systems, see "Prime Mover Driven Generator Systems--a. Electric Motor Driven Generator Systems" of the class definition of this class (322).

**40** This subclass is indented under the class definition. Subject matter wherein a power transmitting mechanism is interposed between the generator and driving means and the transmitting mechanism is controlled to control the energy supplied to the generator by the driving means.

(1) Note. See Lines With Other Classes, "Nonelectrical Means Controlling the Generator" of the class definition for a reference to the nonelectrical means for controlling the power transmission means for the generator included in this class.

SEE OR SEARCH THIS CLASS, SUBCLASS:

10+, for this subject matter where the system includes means to control power transmission mechanism for starting and/or stopping the generator (putting the generator into and/or out of service), see indented subclass 12 where the system includes a clutching means between the generator and driving means for connecting or completely disconnecting the drive connection.

SEE OR SEARCH CLASS:

60, Power Plants, subclasses 325+, for a fluid transmission, per se, in which a driven fluid impeller supplies motive fluid to an output motor.

192, Clutches and Power-Stop Control, appropriate subclasses for clutches and mechanism involving the joint control of the application of power and brake or other stopping means.

310, Electrical Generator or Motor Structure, subclasses 92+ for magnetic clutches.

475, Planetary Gear Transmission Systems or Components, for planetary gearing power transmissions.

476, Friction Gear Transmission Systems or Components, subclass 11 for electric or magnetic control of friction gear transmissions.

**41** This subclass is indented under subclass 40. Subject matter wherein the power transmitting mechanism is of the friction type.

SEE OR SEARCH CLASS:

192, Clutches and Power-Stop Control, subclasses .02 through .098, for mechanism for the joint control of a motor and clutch, subclass 3.5, for mechanism for the joint control of the power transmission and a brake, subclasses 12+, for mechanism having a clutch and brake applied alternately to drive and retard the mechanism, subclasses 30+, for clutches, see indented subclasses 103+, for speed responsive clutches.

475, Planetary Gear Transmission Systems or Components, subclasses 183+, for frictional planetary gearing.

476, Friction Gear Transmission Systems or Components, subclass 11 for electric or magnetic control of friction gear transmissions.

**42** This subclass is indented under subclass 40. Subject matter wherein the friction type power transmitting mechanism is in the form of a belt drive.

SEE OR SEARCH CLASS:
474, Endless Belt Power Transmission Systems or Components, appropriate subclasses for an endless belt power transmission.

**43** This subclass is indented under subclass 42. Subject matter wherein the belt drive is controlled by controlling belt slip.

SEE OR SEARCH CLASS:
474, Endless Belt Power Transmission Systems or Components, appropriate subclasses for variable speed belt drive; and subclasses 101+ for means for adjusting belt tension.

**44** This subclass is indented under the class definition. Subject matter and not classified in one of the preceding subclasses wherein the generator system is controlled by controlling the generator.

(1) Note. See Lines With Other Classes, "Nonelectrical Means Controlling the Generator" of the class definition for a reference to the nonelectric control system for generators included in this class.

SEE OR SEARCH THIS CLASS, SUBCLASS:
2, for this subject matter where the electric generator is not of the electromagnetic induction type.
3, for this subject matter where the generator is a reciprocating and/or oscillating type generator.
4, for this subject matter where the generator is provided with flywheels or massive moving parts.
5+, for this subject matter where the polarity of the output voltage of the generator is controlled.
7, for this subject matter where the system includes control of the generating means and control of the output circuit.
9, for this subject matter where the generator is provided with a plurality of driving means.
10+, for this subject matter where means are provided for stopping or starting the generator (putting the generator into service or stopping the generator).
14+, for this subject matter where there is also control of the generator driving means.
17+, for this subject matter where the system includes automatic control means for the generator.

SEE OR SEARCH CLASS:
315, Electric Lamp and Discharge Devices: Systems, subclasses 302+, and the subclasses specified in the notes to the definitions of subclasses for generator supplied lamps and gas or vapor discharge device systems, the generator being provided with control means.
330, Amplifiers, particularly subclass 58 for amplifiers having a dynamoelectric machine as the active element.

**45** This subclass is indented under subclass 44. Subject matter wherein the generator control is effectuated by a plurality of diverse controls (e.g., combined control by controlling field structure and field excitation).

SEE OR SEARCH THIS CLASS, SUBCLASS:
7+, for this subject matter where the systems include control of the generating means and control of the armature circuit.
17+, for this subject matter where the system includes automatic control means for the generator.

SEE OR SEARCH CLASS:
318, Electricity: Motive Power Systems, subclass 491, for combined motor circuit and motor structure controls and subclass 493 for combined armature and field circuit controls.

**46** This subclass is indented under subclass 44. Subject matter wherein the generator field structure combines permanent magnet and wound field structure.

SEE OR SEARCH CLASS:

310, Electrical Generator or Motor Structure, subclass 181 for structure of a generator having both a permanent magnet and a wound field structure.

**47** This subclass is indented under subclass 43. Subject matter wherein the generator is an induction generator.

(1) Note. An induction generator is a dynamoelectric machine having the same structure as an induction motor. It operates as a generator when connected to a line which can supply a leading current component for exciting the machine and it is driven at a greater than synchronous speed. Since it is structurally identical with an induction motor, Classes 172 and 318 should be searched for structural features.

SEE OR SEARCH CLASS:

310, Electrical Generator or Motor Structure, subclasses 166+ for induction motor structure.

318, Electricity: Motive Power Systems, subclasses 727+ for induction motor systems. See (1) Note above.

**48** This subclass is indented under subclass 44. Subject matter wherein the generator is an acyclic or homopolar type generator.

(1) Note. An acyclic or homopolar generator is a generator in which the voltage generated in the active conductors maintains the same direction with respect to those conductors. Such machines are of the commutatorless type.

SEE OR SEARCH CLASS:

310, Electrical Generator or Motor Structure, subclass 178 for the structure of a homopolar or acyclic generator.

318, Electricity: Motive Power Systems, subclass 253, for homopolar motor systems.

376, Induced Nuclear Reactions: Processes, Systems, and Elements, subclasses 100+ for plasma generating and control devices, yielding or intended to yield sustained nuclear (fusion) reactions.

**49** This subclass is indented under subclass 44. Subject matter wherein the generator is controlled by controlling the structure of parts which form at least a portion of the magnetic circuit of the generator.

(1) Note. See Lines With Other Classes, "Nonelectrical Means Controlling the Generator" of the class definition for a reference to the nonelectric control means for generator structure which is excluded from this class.

SEE OR SEARCH THIS CLASS, SUBCLASS:

3, for systems within the class definition where the generator has a moving generating means which may be the armature or the field structure which has a reciprocating motion.

57, for generator control under subclass 44 where the generator control means includes means for saturating the generator magnetic structure by means of a winding which is in noninductive relationship to the armature or field winding of the generator.

59+, for generator control under subclass 44 where the generator is controlled by controlling an excitation winding. See indented subclasses 59+, for generator control by means of a variable length field winding.

89+, for generator control under subclass 44 where the generator is controlled by controlling the armature circuit.

SEE OR SEARCH CLASS:

310, Electrical Generator or Motor Structure, subclass 191 for adjustable magnetic structure for generators.

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclasses, particularly subclass 123, for a battery or capacitor charging or discharging system including a generator.

388, Electricity: Motor Control Systems, subclasses 835+ for running-speed control systems in which motor structure is altered.

**50** This subclass is indented under subclass 49. Subject matter wherein the generator magnetic structure includes a magnetic shunt for the field flux. Such shunt diverts the field flux away from the armature.

**51** This subclass is indented under subclass 49. Subject matter wherein the generator magnetic structure control relates to the rotor element or rotating member of the generator.

(1) Note. While the rotor element usually is the armature in a direct current machine, it may be either the armature or field structure of an alternating current machine depending on its design.

**52** This subclass is indented under subclass 49. Subject matter wherein the generator magnetic structure control relates to the stator element or the portion of the generator which contains the stationary (nonrotary) parts of the magnetic circuit.

(1) Note. While the stator element usually is the field structure in a direct current machine, it may be either the armature or field structure of an alternating current machine depending on its design.

**53** This subclass is indented under subclass 44. Subject matter where the generator has one or more pairs of load brushes and an auxiliary (or third) brush intermediately positioned between the load brushes with one of the generator windings (field or armature) or a portion thereof or a circuit connected between the auxiliary brush and one load brush.

(1) Note. This subclass includes systems having a third brush type generator with the field winding or a field winding connected between the auxiliary (or third) brush and one load brush. Also included are generator systems having the armature winding or a portion thereof connected to a short circuit between the auxiliary (or third brush) and one load brush.

SEE OR SEARCH THIS CLASS, SUBCLASS:

54+, for generator systems within the class definition where the generator control includes means to adjust the position of the generator brushes.

91+, for generator systems within the class definition where the generator is controlled by short circuiting the armature winding or a portion thereof, see indented subclass 92 where the generator is provided with a pair of auxiliary brushes and the short circuit is between the auxiliary brushes (cross-field generators).

SEE OR SEARCH CLASS:

307, Electrical Transmission or Interconnection Systems, subclasses 9.1+ for third brush generators used in electric systems on vehicles.

310, Electrical Generator or Motor Structure, subclass 148 for dynamoelectric machines having a third brush or additional sets of brushes.

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclasses, particularly subclass 123, for a battery or capacitor charging or discharging system including a generator.

**54** This subclass is indented under subclass 44. Subject matter wherein the generator control includes means to adjust the current collecting mechanism (brushes).

(1) Note. This subclass includes adjusting the position of the brush and brush lifting.

SEE OR SEARCH CLASS:

310, Electrical Generator or Motor Structure, subclass 240 for brush lifters for dynamoelectric machines, and subclass 241 for circumferential adjustment of the brushes for a dynamoelectric machine.

318, Electricity: Motive Power Systems, subclass 292, for motor reversing systems by brush shifting and subclass 541 for motor control by brush or

other current collector or transfer means control.

388, Electricity: Motor Control Systems, subclass 836 for running-speed control systems in which brushes are moved.

**55** This subclass is indented under subclass 54. Subject matter wherein the current collecting mechanism control includes circumferential movement of the mechanism.

SEE OR SEARCH CLASS:

310, Electrical Generator or Motor Structure, subclass 241 for circumferential adjustment of the brushes for a dynamoelectric machine.

318, Electricity: Motive Power Systems, subclass 292 for motor reversing by circumferential movement of brushes, and subclass 541, for motor control by circumferential movement of brushes.

388, Electricity: Motor Control Systems, subclass 836 for running-speed control systems in which brushes are moved.

**56** This subclass is indented under subclass 55. Subject matter wherein the circumferentially movable current collecting mechanism is moved continuously.

**57** This subclass is indented under subclass 44. Subject matter wherein the generator control includes means for saturating at least a portion of the generator magnetic structure without introducing therein a magneto-motive force which either aids or opposes the magneto-motive force produced by the armature or field windings.

(1) Note. The saturating means is usually a winding which is in inductive relationship to the magnetic structure to be saturated, and which is in noninductive relationship to the armature and field windings.

SEE OR SEARCH THIS CLASS, SUBCLASS:

49, for generator systems within the class definition where the generator is controlled by controlling the structure of parts which form at least part of the magnetic circuit of the generator.

SEE OR SEARCH CLASS:

323, Electricity: Power Supply or Regulation Systems, subclasses 249, 302, 310, and 329, for saturable reactors.

**58** This subclass is indented under subclass 44. Subject matter wherein the system includes means for suppressing, eliminating or minimizing undesired frequencies.

(1) Note. The suppressing, eliminating or minimizing means may be in any of the generator circuits (excitation circuit, armature circuit, etc.).

SEE OR SEARCH CLASS:

333, Wave Transmission Lines and Networks, subclasses 167+ for wave filter networks.

**59** This subclass is indented under subclass 44. Subject matter wherein the generator is controlled by controlling an excitation winding or an excitation winding circuit.

SEE OR SEARCH THIS CLASS, SUBCLASS:

6, for generator systems within the class definition which are provided with means to control the polarity of the generator by controlling the excitation of the generator.

45, for this subject matter where the generator is controlled by a plurality of diverse controls (e.g. controlling field structure and field excitation).

46, for generator control systems under subclass 44 where the generator field structure combines permanent magnet and wound field structure.

48, for generator control systems under subclass 44 where the generator is an acyclic or homopolar generator with means to control an excitation winding or an excitation winding circuit.

49+, for generator control systems under subclass 44 where the generator is controlled by controlling the structure of the parts which form the magnetic circuit of the generator.

53, for generator control systems under subclass 44 where the generator has an odd number of brushes (3rd brush type) including such systems where the generator has a field winding connected between the auxiliary (3rd) brush and one of the load brushes.

54+, for generator control systems under subclass 44 where the generator control includes means to adjust the current collection mechanism (brushes).

57, for generator control systems under subclass 44 where the generator control includes means for saturating at least a portion of the generator structure by means of a winding which is in noninductive relationship to the armature and field winding.

58, for generator control systems under subclass 44 where the system includes means (such as a filter) for eliminating, suppressing or minimizing undesired frequencies.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, and subclasses 521+, for motor field circuit control, subclasses 710+ for synchronous motor field excitation removal; subclasses 712+ for synchronous motor field excitation application; subclasses 716+ for synchronous motor field circuits.

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclasses, particularly subclass 123, for a battery or capacitor charging or discharging system including a generator.

330, Amplifiers, particularly subclass 58 for amplifier systems whose active element is a rotating dynamoelectric machine.

388, Electricity: Motor Control Systems, subclasses 843 and 849+ for field circuit acceleration control systems.

**60** This subclass is indented under subclass 59. Subject matter wherein a substitute or auxiliary source of voltage is provided to energize the excitation circuit of the generator during the starting period so that the generator can "build up" its output voltage means being provided for discontinuing the supply to the excitation circuit from the substitute or auxiliary source when the generator has attained a predetermined output voltage.

SEE OR SEARCH THIS CLASS, SUBCLASS:

10, for generator systems within the class definition where means are provided for physical starting and putting the generator into service.

28, for generator systems within the class definition having automatic control means responsive to the generator output voltage for discontinuing the supply of the voltage to the excitation circuit when the generator output voltage has attained a predetermined value.

86, for generator systems under subclass 59 having the generator excitation circuit supplied from two or more sources of electric energy, both sources usually being used during the normal operation of the generator.

**61** This subclass is indented under subclass 59. Subject matter wherein the current supplied to the excitation circuit is alternating current.

(1) Note. Where alternating current is rectified and the rectified current is supplied to the field winding, this patent is not classified in this subclass but will be found in subclass 79.

SEE OR SEARCH THIS CLASS, SUBCLASS:

79, see note 1, above.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclasses 244+, for alternating current commutating motors, subclasses 246+, for alternating current series motors, subclass 700, for synchronous motor alternating current energized field circuits; subclasses 731+ for induction motors having a secondary winding energized also by alternating current; subclass 737 for induction motors having an added primary winding energized by induction from a secondary motor winding.

363, Electric Power Conversion Systems, subclasses 174+ for dynamoelectric frequency converter systems wherein the converter is excited with alternating current.

**62** This subclass is indented under subclass 59. Subject matter where the generator has a plurality of poles, the generator or the excitation circuit being designed so that the generator may be operated as a generator having one number of sets of poles or as a generator having another and different number of sets of poles.

(1) Note. For example, the generator may be provided with eight poles, the generator or the excitation circuit being arranged so that the generator may be operated as an eight pole generator or a four pole generator.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclass 704 for plural pole type synchronous motors, subclasses 773+ for plural pole type induction motors, and subclass 524 for plural pole type motor systems.

**63** This subclass is indented under subclass 59. Subject matter wherein the generator is provided with more than one field winding.

(1) Note. A plurality of windings connected in series or parallel to produce only one magnetic field is considered to be only a single field winding. To be classified in this or the indented subclasses, the generator should have a plurality of windings connected in circuit to produce a plurality of different magnetic fields. One of the windings may produce a magnetic field which opposes the field produced by another winding in indented subclass 64.

SEE OR SEARCH THIS CLASS, SUBCLASS:

57, for generator systems under subclass 44, where the generator is provided with a winding for saturating at least a portion of the generator magnetic structure without introducing a magneto-motive force which either aids or opposes the magneto-motive force produced by the field or armature winding.

62, for generator systems under subclass 59, where the field windings or excitation circuits are designed so that the generator may be operated as either a generator having one number of sets of poles or as a generator having another and different number of sets of poles (i.e., either an 8-pole or a 4-pole generator).

SEE OR SEARCH CLASS:

310, Electric Generator or Motor Structure, subclasses 184+ for dynamoelectric machine structure having a plurality of field or excitation windings.

315, Electric Lamp and Discharge Devices: Systems, subclasses 304+, for electric lamp and gas or vapor discharge device systems having the supply generator supplied with a plurality of fields for regulating the system.

318, Electricity: Motive Power Systems, subclasses 297+, for motor reversing systems having plural field windings, and subclasses 523+, for motor control systems having plural field windings, subclasses 700+ for synchronous motor systems having plural field windings, particularly subclasses 716+ for field circuits of synchronous motors.

320, Electricity: Battery and Condenser Charging and Discharging, subclass 65 for generation systems for battery charging having plural field windings.

388, Electricity: Motor Control Systems, subclasses 801+, 803+ and 826+ for running-speed control systems for motors with more than one field winding, and 843 and 849+ for acceleration control systems for motors with more than one field winding.

**64** This subclass is indented under subclass 63. Subject matter wherein the magnetomotive force of at least one field winding is opposed to the magnetomotive force of at least one other field winding.

(1) Note. Where the generator includes a plurality of field windings, some of which are opposed and others aid, the subject matter is found in this subclass.

SEE OR SEARCH CLASS:
310, Electrical Generator or Motor Structure, subclass 188 for dynamoelectric machines having plural differentially related field windings.
318, Electricity: Motive Power Systems, subclass 525, for motor systems wherein the motor is provided with plural differentially related field windings.
320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclasses, particularly subclass 123, for a battery or capacitor charging or discharging system including a generator.

**65** This subclass is indented under subclass 63. Subject matter wherein the generator is provided with interpole or commutating pole windings.

(1) Note. An interpole or commutating pole is an auxiliary pole member placed between the main pole pieces of a commutating machine. Its exciting winding carries a current proportional to the load current and produces a magnetomotive force which minimizes or eliminates sparking at the brushes.

SEE OR SEARCH CLASS:
310, Electrical Generator or Motor Structure, subclass 186 for dynamoelectric machines having interpole or commutating pole winding structure.

**66** This subclass is indented under subclass 63. Subject matter wherein the plural field windings include compensating windings.

(1) Note. Compensating windings are windings placed in slots in the pole faces of the generator pole pieces which produce a magnetomotive force equal and opposite to that produced by the armature and so prevent field distortion.

SEE OR SEARCH CLASS:
310, Electrical Generator or Motor Structure, subclass 186 for dynamoelectric machines having compensating winding structure.

**67** This subclass is indented under subclass 59. Subject matter wherein the excitation of the generator is produced by a series field winding.

SEE OR SEARCH THIS CLASS, SUBCLASS:
63+, for this subject matter where the generator has other field windings in addition to the series field winding.

SEE OR SEARCH CLASS:
318, Electricity: Motive Power Systems, subclasses 246+, for series motor systems.

**68** This subclass is indented under subclass 59. Subject matter wherein the excitation of the generator is controlled by short circuiting a field winding.

SEE OR SEARCH THIS CLASS, SUBCLASS:
50, for generator control under subclass 44 where the generator is provided with a magnetic shunt to shunt the field flux from the armature.
71, for generator control where only a portion of the field winding is short circuited so that the generator is controlled by varying the length of a field winding.

SEE OR SEARCH CLASS:
318, Electricity: Motive Power Systems, subclass 528, for motor control with means to short circuit a field winding and subclass 299 for motor reversing control with means for short circuiting one or more field windings.

**69** This subclass is indented under subclass 59. Subject matter wherein the generator excitation is controlled by interrupting the supply of voltage to a field winding by means of a circuit maker and breaker.

SEE OR SEARCH THIS CLASS, SUBCLASS:

54, for generator control under subclass 44 where the supply of voltage to the excitation circuit is interrupted by lifting the generator brushes.

72+, for generator control under subclass 59 where the excitation circuit is controlled by means of an electric space discharge device, vacuum tube gas vapor tube, or arc which may at times interrupt the supply of voltage to a field winding.

83, for generator control under subclass 59 where the excitation circuit is controlled by short circuiting a resistor in the excitation circuit, thereby varying the flow of current to a field winding.

SEE OR SEARCH CLASS:

307, Electrical Transmission or Interconnection Systems, subclass 104 for electrical systems which include therein an electromagnet or other highly inductive device.

318, Electricity: Motive Power Systems, subclasses 710+ for synchronous motors having field circuit control by breaking the field supply circuit.

361, Electricity: Electrical Systems and Devices, subclasses 52+ for safety and protection systems where the source of energy is controlled to control an improper operating condition (e.g., line fault).

**70** This subclass is indented under subclass 69. Subject matter wherein the generator excitation circuit is intermittently completed and opened.

(1) Note. The effective average excitation current is determined by the frequency of the interruption and the ratio of the time the circuit is completed to the time the circuit is broken.

SEE OR SEARCH THIS CLASS, SUBCLASS:

84, for generator control systems under subclass 59 where a resistor in series with a field winding is periodically short circuited.

SEE OR SEARCH CLASS:

200, Electricity: Circuit Makers and Breakers, subclasses 19.01+ for miscellaneous periodic switches.

307, Electrical Transmission or Interconnection Systems, subclasses 96+ for electrical systems which are regulated by an intermittent regulatory interruption of the system.

318, Electricity: Motive Power Systems, subclass 537 for motor control by intermittently or repetitiously operated field circuit making and/or breaking means.

335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, subclasses 87+ for electromagnetically operated periodic switches.

**71** This subclass is indented under subclass 59. Subject matter wherein the generator excitation is controlled by varying the length of the field windings.

(1) Note. The variation in length of the field winding is usually attained by providing the field winding with taps.

SEE OR SEARCH THIS CLASS, SUBCLASS:

49, for generator control systems under subclass 44 where the control of the generator is effected by controlling the structure of the magnetic circuit of the generator.

SEE OR SEARCH CLASS:

310, Electrical Generator or Motor Structure, subclass 189 for dynamoelectric machine structure having the field or excitation windings adjustable as to effective length, as by taps.

318, Electricity: Motive Power Systems, subclass 235 for induction motor secondary circuit control having variable number of effective conductors or turns, and subclass 531, for motor control by variable length field winding.

**72** This subclass is indented under subclass 59. Subject matter wherein the generator excitation circuit is controlled by means of one or more electric space discharge devices.

SEE OR SEARCH CLASS:

315, Electric Lamp and Discharge Devices: Systems, appropriate subclasses for systems for controlling the operation of electric lamps and gas or vapor discharge devices.

318, Electricity: Motive Power Systems, and 532, for motor control by space discharge device in field circuit.

323, Electricity: Power Supply or Regulation Systems, subclasses 227 and 291, for space discharge device regulating systems.

327, Miscellaneous Active Electrical Nonlinear Devices, Circuits, and Systems, subclasses 518+ for miscellaneous control circuits utilizing an electronic space discharge device.

388, Electricity: Motor Control Systems, art collections 913+ for motor control systems including space discharge devices.

**73** This subclass is indented under subclass 72. Subject matter wherein the space discharge device is provided with a discharge control device in addition to the load current carrying electrodes.

(1) Note. The control device controls the conductivity of the space discharge device. It may take such forms as an electrostatic grid, an electromagnetic winding for a magnetic field in which the discharge is controlled or an igniting device for initiating the flow of current in a vapor or gas discharge device.

SEE OR SEARCH CLASS:

315, Electric Lamp and Discharge Devices: Systems, subclasses 349+ and the subclasses specified in the notes to the definition of those subclasses for systems for controlling the operation of gas or vapor discharge devices (including lamps) of the discharge control type.

318, Electricity: Motive Power Systems, subclasses 677+, particularly subclass 682, for position servomechanisms including space discharge type controls subclasses 700+ for induction motor control having primary or armature circuit control by space discharge devices, subclasses 727+ for induction motor control having secondary circuit by space discharge devices, subclasses 505+, for motor control by space discharge devices in armature circuit, and subclass 532 for motor control by space discharge devices having control elements in field circuit.

323, Electricity: Power Supply or Regulation Systems, subclasses 227 and 291, for space discharge regulating systems wherein the space discharge device is provided with a discharge control element.

327, Miscellaneous Active Electrical Nonlinear Devices, Circuits, and Systems, subclasses 518+ for miscellaneous control circuits utilizing an electronic space discharge device.

388, Electricity: Motor Control Systems, art collections 913+ for motor control systems including space discharge devices.

**74** This subclass is indented under subclass 72. Subject matter wherein the space discharge device or devices are electric arcs.

(1) Note. The systems in this subclass are limited to those in which the discharge is between electrodes exposed to the atmosphere. Other systems under subclass 72 where the discharge has negative resistance characteristics (arc) are in subclass 72 or indented subclass 73 where the discharge device has a control device.

SEE OR SEARCH THIS CLASS, SUBCLASS:

72, see note 1 above.

73, see note 1 above.

SEE OR SEARCH CLASS:

314, Electric Lamp and Discharge Devices: Consumable Electrodes, appropriate subclasses for systems, including arc discharge devices of the consumable electrode type which are provided with means for controlling current flowing in the arc.

315, Electric Lamp and Discharge Devices: Systems, subclasses 326+ and the subclasses specified in the notes to these subclasses, for miscellaneous systems for controlling the operation of electric arcs.

323, Electricity: Power Supply or Regulation Systems, subclasses 227 and 291, for space discharge device regulating systems of the electric arc type.

**75** This subclass is indented under subclass 59. Subject matter wherein the excitation of the generator is controlled by means of impedance in the excitation circuit.

SEE OR SEARCH THIS CLASS, SUBCLASS:

72, for generator field control by means of space discharge devices. Under some conditions, a space discharge device may be used as an impedance and subclasses 72+ should be searched for such systems.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclasses 249+, for series motor control by means of motor circuit impedance, and subclasses 534+ and 533+, for motor control by field circuit impedance, subclasses 700+ for synchronous motor control, particularly subclasses 710+ for field circuit control by means of impedance; subclass 784 for impedance control of the induction motor primary circuit during starting; subclass 792 for single phase start winding removal control circuit which includes a variable temperature coefficient impedance in circuit; subclasses 794+ for split phase capacitor motor circuits; subclass 796 for split phase capacitor motor circuits including a saturable winding in the circuits; subclass 797 for split phase motor circuits using saturable winding in the circuits; subclass 804 for induction motor primary circuits responsive to speed or rotation phase angle with controlled magnetic reactance in circuits; subclasses 814+ for voltage control of induction motor primary circuit by impedance; subclasses 816+ for split phase induction motors with voltage control of primary circuit by impedance; subclasses 821+ for induction motor control with impedance in secondary circuit.

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclasses, particularly subclass 123, for a battery or capacitor charging or discharging system including a generator.

323, Electricity: Power Supply or Regulation Systems, subclass 364, for impedance systems in general.

338, Electrical Resistors, subclasses 68+ for mechanically variable electrical resistors such as rheostats.

361, Electricity: Electrical Systems and Devices, subclasses 277+ for variable condensers.

388, Electricity: Motor Control Systems, subclasses 800+ and 825+ for motor speed control systems and 842+ and 848+ for motor acceleration control systems including selectable or variable impedance devices.

**76** This subclass is indented under subclass 75. Subject matter wherein the generator excitation circuit impedance control involves plural impedances.

(1) Note. This subclass takes arrangements wherein there are a plurality of different impedances in the field circuit. A sectionalized impedance is not considered to be a plurality of impedances (e.g., a plurality of resistance sections connected in series with means for controlling the number of sections in the field circuit would be searched in subclass 80).

SEE OR SEARCH THIS CLASS, SUBCLASS:

80+, see note 1 above.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclass 534, for motor control by plural field circuit impedances.

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclasses, particularly subclass 123, for a battery or capacitor charging or discharging system including a generator.

323, Electricity: Power Supply or Regulation Systems, subclass 364, for impedance systems involving plural impedances.

**77** This subclass is indented under subclass 76. Subject matter wherein the plural impedances form a bridge.

(1) Note. A bridge is a four terminal closed circuit impedance network having alternate terminals connected to input and output terminals respectively.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclasses 663+, for position servomechanisms which may include a bridge in the error detector circuit and subclass 535 for motor control by means of bridge network impedance control.

323, Electricity: Power Supply or Regulation Systems, subclass 365, for bridge networks.

324, Electricity: Measuring and Testing, subclasses 600+ for impedance measuring bridge networks, and subclasses 98+ and 101 for bridge networks utilized in electric meters.

333, Wave Transmission Lines and Networks, subclass 169 for wave filters of the Wheatstone bridge or lattice type.

**78** This subclass is indented under subclass 76. Subject matter wherein the plural impedances in the excitation circuit make up a tuned or resonant circuit. Such circuit must include both capacitance and inductance.

SEE OR SEARCH CLASS:

333, Wave Transmission Lines and Networks, subclasses 175+ for wave filters of the resonant, discrete frequency selective type, and subclasses 219+ for resonators of the distributed parameter type.

334, Tuners, appropriate subclass for tuned networks for use in wave energy apparatus and comprising inductance and capacitance elements in circuit arrangement to form a resonant circuit and in which structure is provided for adjusting one or both of these elements for changing the mean resonant frequency of the circuit.

**79** This subclass is indented under subclass 75. Subject matter wherein a rectifier or unidirectionally conductive element is used as an excitation circuit impedance.

(1) Note. This subclass is not concerned with the use of a rectifier in the excitation circuit to convert alternating to direct current. Such an arrangement is found throughout subclasses 59 to 88 depending on the significant control arrangement of the excitation circuit.

SEE OR SEARCH THIS CLASS, SUBCLASS:

59+, see note 1 above.

78+, for generator excitation control systems under subclass 59 having a plurality of impedances.

SEE OR SEARCH CLASS:

257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), appropriate subclasses for active solid-state devices which may be used as rectifying elements.

323, Electricity: Power Supply or Regulation Systems, subclass 364, for circuits using rectifiers as impedance elements.

**80** This subclass is indented under subclass 75. Subject matter wherein the generator excitation circuit is controlled by means of one or more resistors.

SEE OR SEARCH THIS CLASS, SUBCLASS:

76+, for generator excitation control systems under subclass 59 having a plurality of impedances.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclasses 700+, particularly subclasses 716+, for synchronous motor field control by resistance; subclass 784 for resistance control of the induction motor primary circuit during starting; subclass 814 for resistance control of the primary circuit voltage during running; subclasses 821+ for resistance control of the induction motor secondary during running; subclasses 238+, for induction motor secondary circuit control by resistance, and subclasses 533+ for motor field resistance control.

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclasses, particularly subclass 123, for a battery or capacitor charging or discharging system including a generator.

323, Electricity: Power Supply or Regulation Systems, subclass 364, for miscellaneous resistance systems.

338, Electrical Resistors, appropriate subclasses, for electrical resistors and rheostats.

388, Electricity: Motor Control Systems, subclasses 800+ and 825+ for motor speed control systems and 842+ and 848+ for motor acceleration control systems including selectable or variable impedance devices.

**81** This subclass is indented under subclass 80. Subject matter wherein the excitation circuit resistor is a temperature variable resistor.

(1) Note. Thermally varied resistances may either be (1) resistors whose resistance varies inherently with variation in temperature (e.g., the resistance of copper increases with increase in temperature while the resistance of carbon decreases with increase in temperature) or (2) resistors which are varied by means of a temperature responsive operator.

SEE OR SEARCH THIS CLASS, SUBCLASS:

33+, for automatic control of the generator in response to thermal conditions.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclasses 471+, for thermally responsive motor control systems and subclass 533 for motor control having thermally varied field resistance.

320, Electricity: Battery or Capacitor Charging or Discharging, subclasses 150+ for a charging or discharging circuit for a battery or capacitor that includes thermal condition detection.

323, Electricity: Power Supply or Regulation Systems, subclass 369, for thermally varied resistance systems.

338, Electrical Resistors, subclasses 25+ for variable electrical resistors responsive to a change in ambient temperature.

**82** This subclass is indented under subclass 80. Subject matter wherein the excitation circuit resistor is a pressure variable resistor.

(1) Note. Although the usual pressure varied resistor takes the form of a carbon pile, this subclass is not restricted thereto.

SEE OR SEARCH THIS CLASS, SUBCLASS:

17, for generator systems within the class definition wherein the generator is automatically controlled in response to a condition (as a pressure condition), see indented subclass 35 for such automatic control systems where the generator is controlled in response to fluid pressure.

35, for fluid pressure responsive generator control.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclass 481 for electric motor control in response to pressure in a fluid or granular material and subclass 533

for motor field circuit control including pressure varied resistor.

320, Electricity: Battery and Condenser Charging and Discharging, subclass 70, for generation systems for battery charging with pressure varied impedance field circuit control.

323, Electricity: Power Supply or Regulation Systems, subclass 295, for resistance systems including pressure varied resistors.

338, Electrical Resistors, subclasses 36+ for fluid or gas pressure actuated electrical resistors, and subclasses 99+ for electrical resistors of the compressible type.

**83** This subclass is indented under subclass 80. Subject matter wherein the generator excitation circuit is controlled by short circuiting the resistor or a portion thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:

68, for generator control systems under subclass 59 where the excitation of the generator is controlled by short circuiting a field winding.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclass 533, for electric motor field circuit control by short circuiting a resistor.

323, Electricity: Power Supply or Regulation Systems, subclasses 297 and 298, for resistance systems including short circuited resistors.

**84** This subclass is indented under subclass 83. Subject matter wherein the short circuit of the control resistor is intermittently completed and opened.

(1) Note. In the systems in this subclass the effective value of the resistor is determined by the periodicity of the circuit making and breaking and the ratio of the time the shunting circuit is open to the time it is closed.

SEE OR SEARCH THIS CLASS, SUBCLASS:

70, for generator control by continuous making and breaking of the excitation. In subclass 70 the excitation circuit is periodically opened and closed.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclass 533 for motor control by means of intermittently short circuiting and opening a short circuit about a resistance in the excitation circuit.

**85** This subclass is indented under subclass 83. Subject matter wherein the excitation circuit resistor is short circuited step by step.

(1) Note. In some of the systems in this subclass, the resistor is divided into a plurality of sections and switching means are provided so that each of the portions may be short circuited in regular order so that at one extreme of the switching operation all sections are short circuited and at the other extreme, none of the sections are short circuited. To be classified in this subclass, the resistor need not be arranged so that the sections are short circuited in regular order. The system may be arranged so that the resistor sections may be short circuited in any order desired.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclass 533 for motor control short circuiting step by step of field resistor.

323, Electricity: Power Supply or Regulation Systems, subclass 297, for resistance systems wherein a resistor is short circuited step by step.

**86** This subclass is indented under subclass 59. Subject matter wherein the generator excitation circuit is energized from two or more sources of electric energy and the excitation current depends on the resultant of the two or more voltages impressed thereby.

(1) Note. Usually one of the sources of electric energy is the generator output to which is added or from which is sub-

tracted the auxiliary electromotive force. Usually both sources of electric energy are used in the normal operation of the generator.

SEE OR SEARCH THIS CLASS, SUBCLASS:

60, for generator systems under subclass 59 having a substitute or auxiliary source of electric energy to energize the excitation circuit during the starting period, the supply from the substitute or auxiliary source being discontinued after the generator has "built up" to a predetermined voltage.

SEE OR SEARCH CLASS:

307, Electrical Transmissions or Interconnection Systems, subclasses 43+ for electrical systems in which a single load is supplied by a plurality of sources or supply circuits for electrical energy.

318, Electricity: Motive Power Systems, and subclass 530 for motor control by field circuit having plural sources of field circuit voltage.

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclasses, particularly subclass 123, for a battery or capacitor charging or discharging system including a generator.

**87** This subclass is indented under subclass 86. Subject matter wherein one of the sources of electric energy is a dynamoelectric machine other than the load generator.

SEE OR SEARCH CLASS:

307, Electrical Transmission or Interconnection Systems, subclass 76 for interconnection systems for plural generators of different voltages, subclasses 78+ for systems of series connected generators, and subclass 84 for systems including plural generators.

**88** This subclass is indented under subclass 86. Subject matter wherein one of the sources of electric energy is a battery.

SEE OR SEARCH CLASS:

307, Electrical Transmission or Interconnection Systems, subclasses 48+ for systems having plural sources of current in which one source is a battery floating across the line, and subclasses 66+ for systems having plural alternative sources of current in which one source is a battery.

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclass for charging or discharging plural batteries.

**89** This subclass is indented under subclass 44. Subject matter wherein the generator is controlled by controlling the armature circuit, or the primary circuit of the generator.

(1) Note. Since the armature circuit or primary circuit of the generator may be extended to a system of distribution, to a load circuit or to a load device, see the class definition, especially section I,D, for the general line between Class 322 and other classes which have generator supplied load circuits, or systems of distribution or load devices. This and the indented subclasses include the generator supplied systems in Class 322 which are not classified in the subclass above and which have means in the armature circuit for controlling the generator.

SEE OR SEARCH THIS CLASS, SUBCLASS:

5, for generator control systems within the class definition having means to control the polarity of the generator.

7, for generator control systems within the class definition where both the generator and the load circuit are controlled. See note 1 to the definition of subclass 89.

14, for generator control systems within the class definition where both the generator and the generating driving means are controlled.

17+, for this subject matter where the armature circuit is automatically controlled in response to a condition.

45, for generator control under subclass 44 where the generator control is

effectuated by a plurality of diverse controls one of which may be controlling the armature or primary circuit.

47, for this subject matter where the generator is an induction type generator.

48, for this subject matter where the generator is an acyclic or homopolar generator.

49, for generator control under subclass 44 where the generator is controlled by controlling the structure of parts which form at least a part of the magnetic circuit of the generator, see indented subclass 51 where the magnetic structure so controlled is the rotating member of the generator (i.e., either the armature or field), and indented subclass 52 where the magnetic structure so controlled is the stator element of the generator (i.e., either the armature or the field).

53, for generator control under subclass 44 where the generator is provided with an odd number of brushes (i.e., has an auxiliary brush), and the generator control means includes an armature winding or a portion thereof connected to a short circuit between the odd or auxiliary brush and one of the load brushes.

54+, for generator control systems under subclass 44 where the generator control includes means to adjust the current collecting mechanism (i.e., brushes).

57, for generator control systems under subclass 44 where the control includes means for saturating at least a portion of the generator magnetic structure by means of a winding which is in noninductive relationship to the armature and field windings.

58, for generator control systems under subclass 44 where the system includes means (such as a filter) for eliminating, suppressing, or minimizing undesired frequencies.

SEE OR SEARCH CLASS:

307, Electrical Transmission or Interconnection Systems, subclasses 112+ for switching systems.

318, Electricity: Motive Power Systems, subclass 706 for synchronous motor synchronizing systems with armature winding removal upon failure to synchronize or loss of synchronism; subclass 709 for synchronous motor synchronizing systems having different armature winding voltage prior to synchronism; subclasses 720+ for armature circuits for synchronous motor systems; subclasses 767+ for primary circuit control of induction motors; subclasses 287+, for motor reversing by armature circuit control, and subclass 494, for motor control by armature circuit control.

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclasses, particularly subclass 123, for a battery or capacitor charging or discharging system including a generator.

388, Electricity: Motor Control Systems, subclasses 800+ and 825+ for motor speed control systems and 842+ and 848+ for motor acceleration control systems.

**90** This subclass is indented under subclass 89. Subject matter wherein the armature circuit control comprises plural armature circuits or windings.

(1) Note. A plurality of windings connected in series or parallel so that they constitute only one electrical armature winding is not classified as plural armature windings. To be classified in this subclass, the generator must have a plurality of armature windings connected to form different armature circuits. The plurality of armature windings may be designed so that they might be connected in series or parallel to supply a single load circuit or one of the windings may be for control purposes only.

SEE OR SEARCH CLASS:

307, Electrical Transmission or Interconnection Systems, subclasses 11+ for plural load circuit systems, and subclasses 43+ for plural supply circuit systems.

310, Electrical Generator or Motor Structure, subclasses 140+ for plural commutator generators having plural armature windings, subclasses 144+ for plural slip ring generators having plural armature windings, and subclasses 198+ for plural armature winding structure.

318, Electricity: Motive Power Systems, subclass 724 for synchronous motor armature circuits having a plurality of windings or winding portions; subclass 737 for self-cascaded induction motor systems having a plurality of primary windings; subclasses 768+ for three phase winding induction motor systems operated from a single phase source; subclass 770 for induction motor primary circuits of the dual voltage type; subclass 771 for delta-wye, plural wye, or delta-delta connected induction motor primary circuits; subclass 775 for plural speed single induction motors having a separate primary winding for each speed; subclass 777 for plural speed induction motors having a separate primary winding for each speed; subclasses 288+, for motor reversing by plural armature windings.

**91** This subclass is indented under subclass 89. Subject matter wherein the generator is controlled by short circuiting the armature winding or a portion thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:

47, for generator control systems under subclass 44 where the generator is an induction generator.

53, for the subject matter where the generator is provided with an odd number of brushes (i.e., has an auxiliary brush) and the generator control means includes an armature winding or a portion thereof connected to a short circuit between the odd or auxiliary brush and one of the load brushes.

95+, for generator control by shunting the armature winding through an impedance. Subclass 91 differs from subclass 95 in that in subclass 95 the armature is shunted through a resistance and in this subclass (91) the shunt connection has negligible impedance. See subclass 98 where the shunt circuit contains a resistance.

SEE OR SEARCH CLASS:

307, Electrical Transmission or Interconnection Systems, subclass 100 for systems including means for shunting or short circuiting the same.

310, Electrical Generator or Motor Structure, subclass 177 for dynamoelectric machines having a short circuited winding or conductor.

318, Electricity: Motive Power Systems, subclasses 379+, for motor braking systems having armature short circuiting and subclass 501 for motor armature circuit control by shunting armature in whole or in part.

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclasses, particularly subclass 123, for a battery or capacitor charging or discharging system including a generator.

**92** This subclass is indented under subclass 91. Subject matter wherein the generator is provided with a set of auxiliary brushes spaced 180 electrical degrees apart in addition to the usual load circuit brushes and the short circuit connection is between the auxiliary brushes.

(1) Note. The usual purpose of the above arrangement is to increase armature reaction flux which produces a field in quadrature to the flux produced by the field windings. These devices are called "cross-field generators" in the art. These devices find application for such uses as constant current welding generators and as dynamoelectric amplifier devices.

SEE OR SEARCH THIS CLASS, SUBCLASS:

53, if the generator is provided with an odd or auxiliary brush, and the armature winding or a portion thereof is connected to a short circuit between the odd or auxiliary brush and one of the main brushes.

SEE OR SEARCH CLASS:

310, Electrical Generator or Motor Structure, subclass 151 for dynamoelectric machines having a pair of additional short circuited brushes.

330, Amplifiers, subclass 58 for amplifiers whose active element is a rotating dynamoelectric machine.

**93** This subclass is indented under subclass 89. Subject matter wherein the generator armature circuit control includes a tapped or sectionalized armature.

SEE OR SEARCH THIS CLASS, SUBCLASS:

91+, for generator armature control under subclass 89 where the generator is controlled by short circuiting a portion of the armature winding.

SEE OR SEARCH CLASS:

310, Electrical Generator or Motor Structure, subclass 200 for structure of dynamoelectric machines having tapped or sectionalized armatures.

318, Electricity: Motive Power Systems, subclass 502, for motor armature control having variable length or tapped armature winding.

**94** This subclass is indented under subclass 89. Subject matter wherein the generator armature circuit control includes armature circuit making and/or breaking.

(1) Note. The above arrangement is peculiarly applicable for use in battery charging systems wherein a reverse current cutout is interposed between the generator and battery. Particular attention is directed to Class 320 in the search notes below.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, and subclasses 519+, for motor control by means of armature circuit making and/or breaking devices.

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclasses, particularly subclass 123, for a battery or capacitor charging or discharging system including a generator.

**95** This subclass is indented under subclass 89. Subject matter wherein the generator armature control is by means of impedance in circuit with the armature.

(1) Note. See the class definition, especially sections I, D, for a statement as to other classes which provide for a generator supplied load circuit where the load circuit is controlled by an impedance.

SEE OR SEARCH THIS CLASS, SUBCLASS:

91+, for generator systems having armature or primary circuit control where the system includes means to short circuit the armature winding of the generator.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, subclasses 700+, particularly subclass 720, for synchronous motor systems impedance control of the armature circuit during starting or running; subclass 784 for impedance control of the primary circuit of induction motors during starting; subclass 792 for primary circuit control of the start winding of single phase motors during starting by a variable temperature coefficient impedance element; subclasses 794+ for impedance control of split phase capacitor motors; subclass 796 for saturable winding impedance control of the primary circuit of split phase capacitor run motors; subclass 797 for phase splitting of the primary circuit of split phase motors by a saturable winding; subclass 804 for induction motor primary circuit control with a controlled magnetic reactance; subclasses 814+ for inductor motor primary circuit control by means of impedance, and subclasses 508+ for motor control by means of impedances in armature circuit.

388, Electricity: Motor Control Systems, subclasses 800+ and 825+ for motor speed control systems and 842+ and 848+ for motor acceleration control

systems including selectable or variable impedance devices.

**96** This subclass is indented under subclass 95. Subject matter wherein the generator armature control is by means of a plurality of impedances in circuit with the armature.

(1) Note. The plurality of impedances must be different impedance elements. A tapped or sectionalized impedance element is not a plurality of impedances.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, and subclasses 509+, for motor control by means of plural impedances in armature circuit.

323, Electricity: Power Supply or Regulation Systems, subclass 364, for impedance systems including a plurality of impedances.

388, Electricity: Motor Control Systems, subclasses 800+ and 825+ for motor speed control systems and 842+ and 848+ for motor acceleration control systems including selectable or variable impedance devices.

**97** This subclass is indented under subclass 95. Subject matter wherein the armature circuit impedance is a resistance.

SEE OR SEARCH CLASS:

318, Electricity: Motive Power Systems, and subclasses 514+, for motor control by armature circuit resistor.

323, Electricity: Power Supply or Regulation Systems, subclass 369, for resistance systems.

388, Electricity: Motor Control Systems, subclasses 800+ and 825+ for motor speed control systems and 842+ and 848+ for motor acceleration control systems including selectable or variable impedance devices.

**98** This subclass is indented under subclass 97. Subject matter wherein the resistance is connected across the generator brushes or in shunt to the generator.

SEE OR SEARCH THIS CLASS, SUBCLASS:

91+, for generator control by short circuiting of armature winding. In subclass 91, the shunt circuit is of negligible impedance.

**99** This subclass is indented under the class definition. Subject matter wherein the system is provided with signals, indicators, recorders, or testing means.

(1) Note. For a statement of the systems in this class which include a signal, indicator recorder, or testing, and the general line between Class 322 and the other classes providing for similar subject matter, see the Class 322 Class Definition, Lines With Other Classes, "Load in Output Circuit Recited by Name Only or Significantly,-- Generator and Testing Means for Generator, etc."

SEE OR SEARCH CLASS:

116, Signals and Indicators, appropriate subclasses for nonelectric signals and indicators.

324, Electricity: Measuring and Testing, appropriate subclasses for electric testing.

340, Communications: Electrical, subclasses 500+ for electric signaling systems automatically responsive to a condition.

346, Recorders, appropriate subclasses for recording arrangements.

**100** This subclass is indented under the class definition. Subject matter not classified in any of the foregoing subclasses.

END