

1 R	MISCELLANEOUS	230	...Compression volume is also expansion volume
1 A	.Fuels, lubricants and additives		
2	COMBINED DEVICES	231	...Vane
3	.Generating plants	232	...Interengaging rotors
200	ROTARY	233	...Nonparallel axes
201	.Reversible	234	..Compression volume means axially disposed relative to expansion volume means
202	.With means to control degree of compression		
203	.With combusted gas treatment or handling means	235	...Transfer means in rotor
204	.With compression volume means in uninterrupted communication with expansion volume means	236	...Vane
205	.With fuel injection means	237	...Abutment
206	..And pump or control means	238	...Interengaging rotors
207	..Into intake port	239	..Compression volume means radially disposed relative to expansion volume means
208	..Into intake chamber	240	...Concentric
209	..Into prechamber	241	.With compression, combustion, and expansion in a single variable volume
210	.With ignition means	242	..Planetating rotor
211	..Plural	243	..Vane
212	.With plural compression volume means	244	..Abutment
213	..In series	245	..Alternately approaching and receding elements
214	.With plural expansion volume means	246	...Eccentric interengaging rotors
215	..In series	247	.Only combustion and expansion of charge in engine
216	.With charge treatment means	248	..Abutment
217	..Exhaust gas recirculation	249	..Interengaging rotors
218	..Rotor shape	18 R	OSCILLATING PISTON
219	..Stratification	18 A	.Toroidal cylinder
220	..Preheating	19	LIQUID PISTON
221	.With transfer means intermediate single compression volume means and single expansion volume means	21	CONVERTIBLE CYCLE
222	..Isolated charge in movable transfer element	22	INTERNAL COMBUSTION AND AIR
223	..Reciprocating or oscillating compression volume means	23	SOLID FUEL
224	...Radially spaced from expansion volume means	24 R	GUNPOWDER
225	....Abutment acts as compression means	24 A	.Single shot gun powder motors
226	....Compression means disposed in rotor	25 R	WATER AND HYDROCARBON
227	.....Vane acts as compression means	25 A	.Water in charge
228	..Compression volume means circumferentially disposed relative to expansion volume means	25 B	.Water plus heat into charge
229	...Transfer means in rotor	25 C	.Water into cylinder
		25 D	.Water plus heat into charge
		25 E	.Water introduced by mixing with other materials
		25 F	.Water plus heat by mixing with other materials
		25 G	.Washers and cleaners
		25 H	.Washers and cleaners with heat
		25 J	.Automatic water control
		25 K	.Automatic water control; thermostatic
		25 L	.Automatic water control; suction
		25 M	.Automatic water control; speed

25 N	.Automatic water control interconnected with throttle	273	.Precombustion chamber mounting means
25 P	.Steam injection	274	.Having combustible mixture forming means
25 Q	.Cooling regulation	275	..By fuel injection into precombustion or main combustion chamber
26	ADDITIONAL AIR SUPPLY	276	...Fuel injected into precombustion chamber formed in piston
250	ENGINE MEANS HAVING INTERNAL VAPORIZING IN PRECHAMBER WITH ALL COMBUSTION IN MAIN CHAMBER	277	...By fuel injection into precombustion chamber with carbureted main chamber
251	.Whirling in prechamber	278	...By fuel injection into main chamber with carbureted precombustion chamber
252	.Vaporizing by a hot surface of prechamber	279	.Piston carried precombustion chamber
253	PRECOMBUSTION AND MAIN COMBUSTION CHAMBERS IN SERIES	280	.Atomizer, deflector, or shield in precombustion chamber
254	.Chamber temperature control means	281	.Precombustion chamber shape is a figure of revolution
255	.Vaporizing in precombustion chamber	282	..Figure of revolution is multishaped to form a precombustion chamber
256	.Plural precombustion chambers	283	..Cylindrical
257	.Two-cycle	284	..Spherical
258	.Having timed valves to precombustion and main combustion chambers	285	.Precombustion chamber having a specific shape
259	.Having volumetric relation between precombustion and main combustion chambers	286	.Having specific connecting passage means between precombustion and main combustion chambers
260	.With ignition means particularly positioned relative to precombustion and main combustion chambers	287	..With ignition means in connecting passage
261	.With injection means particularly positioned relative to precombustion and main combustion chambers	288	..Having fuel, a combustible mixture, or air added in the connecting passage
262	.Having fluid whirling means	289	..Fluid flow through passage controlled by working piston
263	..Whirling in precombustion chamber only	290	...With whirling
264	.Precombustion chamber is carried by a valve	291	...Multiple connecting passages
265	.Precombustion and main chambers form an "I" head	292	..With valve means or variable orifice means in the passage
266	.Precombustion chamber assembly inserted in spark plug hole	293	..Having multiple passages
267	..Separate fuel or combustible mixture added to precombustion chamber	294	COMBUSTION CHAMBER MEANS HAVING FUEL INJECTION ONLY
268	.Valveless precombustion chamber	295	.Combustible mixture stratification means
269	.Piston shape complements precombustion chamber discharge	296	.Injector is an integral part of engine valve
270	.Precombustion chamber liner or coating	297	.Combination igniting means and injector
271	..With liner mounting means		
272	..Including combustion catalyst liner or coating means		

298	.Injection of fuel onto igniter, deflector, heater, or atomizer	41.17	.Coolant released into cylinder or valve passages
299	.Using multiple injectors or injections	41.18	.Convertible
300	..Alternating multiple injectors (e.g., series injection)	41.19	.Refrigerating cycle
301	.Injected fuel spraying into whirling fluid	41.2	.With vapor generation and/or condensing
302	.Air entering combustion chamber through plural inlets	41.21	..Coolant circulation with condensing
303	..Having inlet uncovered by working piston	41.22	...Intake or carburetor connection
304	.Injecting diverse fuels or different states of same fuel	41.23	...Entrained in secondary circuit
305	.Having a particular relationship between injection and ignition characteristics (e.g., nozzle location, spray pattern, timing relative to igniter location, timing)	41.24	...From top of jacket to bottom of radiator
		41.25	...Water bypasses condenser
		41.26	...Vapor only circulated
		41.27	...Overflow vent to condenser
		41.28	.Multiple cylinders with equalized cooling
		41.29	.Parallel flow
27 R	BURNING BY HIGHLY COMPRESSED AIR	41.3	.Mixed air and liquid
27 GE	.Gas engines (diesel type) convertible from liquid to gas or operable with liquid and gas	41.31	.With cooling of additional parts or materials
		41.32	..With spark plug heat exchange
		41.33	..With lubricant heat exchange
27 A	.Oil engine air preheated	41.34	.Internal cooling of moving parts; e.g., hollow valves, pistons, and movable cylinder
	OIL ENGINES		
	.Pump supply to air inlet	41.35	..Piston
37	MULTIPLE EXPLOSION	41.36	...Telescoping piston and stationary conduits
38	ATMOSPHERIC		
39	NONCOMPRESSION	41.37	...Hollow piston rod
41 R	REVERSIBLE	41.38	...Wrist pin type; e.g., nonrigidly connected
41 E	.Electrical		
41.01	COOLING	41.39	...Side wall opening
41.02	.Automatic coolant flow control	41.4	..Rotary valves
41.03	..Float control	41.41	..Poppet-type valves
41.04	..Shutters, air valves, dampers or adjustable cowls	41.42	.Liquid coolants other than water and water treatment
41.05	...Temperature and engine operation responsive	41.43	.Movably mounted tank or radiator
41.06	...Servomotor-operated type	41.44	.With liquid coolant circulating means
41.07	...Interrelated shutter and throttle control	41.45	..Jet pumps
41.08	..Valves for fluid coolant	41.46	..Common drive for pump and fan
41.09	...Coolant source bypass	41.47	..Engine shaft driven
41.1	...Radiator or condenser source	41.48	.Devices for cooling liquid by air flow
41.11	..Air impeller	41.49	..Fan type
41.12	...Temperature-responsive	41.5	.Yielding or resilient walls
41.13	.Interrelated coolant flow and throttle control	41.51	.Plural radiators and/or tanks in series
41.14	.System drained and/or heat-storing	41.52	.Engine or cylinder-mounted heat dissipators
41.15	.Indicators and safety devices	41.53	..Hopper type
41.16	.Coolant sealed in cylinder valve or piston	41.54	.With vent

41.55	.Combined	43 B	.Toroidal cylinders
41.56	.Air-cooled	43 C	.Cam transmission
41.57	..With liquid cooling	45 R	ROTARY RECIPROCATING PISTON
41.58	..Flow-regulating means	45 A	.Piston and crankshaft coaxial
41.59	...Adjustable discharge	46 R	FREE PISTON
41.6	..Steam dividing vanes, baffles, conduits, or the like for multiple cylinders	46 A	.Two chambers; one piston
41.61	...Individual deflecting cylinder baffles	46 B	.Phasing means between two or more units
41.62	...Air duct with discharge ports or conduits	46 SC	.Single chamber; one piston
41.63	..With impelling means	46 E	.Electric generating means
41.64	...Jet type	46 H	.Hammer
41.65	...Fan type	47 R	VALVED PISTON
41.66	....Suction	47 A	.Charge passes from crankcase through valve in piston
41.67	..Jacketed cylinder	47 AA	.Lost motion connection actuates valve
41.68	...Spiral passages	47 AB	.Inlet and exhaust valve in piston
41.69	..Finned cylinder and/or head	48 R	ADJUSTABLE COMBUSTION CHAMBER
41.7	..Engine encasing air duct; e.g., cowling	48 A	.Piston in head adjusted manually or mechanically
41.71	.Plural materials	48 AA	.Piston in head adjusted
41.72	.With jacketed head and/or cylinder	48 B	.Piston varied by means in crankshaft, connecting rod or piston
41.73	..Jet or spray within jacket	48 C	.Cylinder or sleeve-moved
41.74	..Multiple cylinder	48 D	.Auxiliary chamber
41.75	..Reentrant head	50 R	RECIPROCATING CYLINDER
41.76	..With cooled valve seats or guides	50 A	.Four-cycle
41.77	...Poppet-type valves	50 B	.Two-cycle
41.78	...Cylinder side wall valves	51 R	MULTIPLE PISTON, COMMON NONRESTRICTIVE COMBUSTION CHAMBER
41.79	..With passages, baffles, etc.	51 A	.Four-cycle
41.8	...Spiral passages	51 AA	..Four-cycle separate crankshaft for piston
41.81	..Cylinder jacket supported solely by cylinder	51 AC	..Two or more combustion chambers between the piston
41.82 R	..With head-cooling arrangements	51 B	.Two-cycle
41.82 A	...Composite head	51 BA	..Two-cycle separate crankshaft for piston
41.83	..Cylinder detachable	51 BB	..Piston offset from crankshaft
41.84	..Flanged cylinder or liner	51 BC	..Plural combustion chamber and plural piston
41.85	.Valve seats or guides	51 BD	..Inlet or exhaust ports in two or more planes
41.86	CRANKCASE VENTILATION	52.1	MULTIPLE CYLINDER
42	OSCILLATING CYLINDER	52.2	.Simultaneous compression, distinct pistons, restricted communication to a single combustion chamber
43 R	ROTATING CYLINDER	52.3	..Four-stroke cycle
44 R	.Radial	52.4	...Multiple crankshafts
44 A	.Wheel	52.5	..Two-stroke cycle
44 B	..Combustion chamber is center of star	52.6	...Multiple crankshafts
44 C	..Two-cycle		
44 D	..Valve casing-cylinders have no valves but have ports which register with ports in casing		
44 E	..Cam transmission		
43 A	.Parallel to shaft		
43 AA	..Parallel to shaft cam track		

53.1	.Cylinder offset from crankshaft axis	59.4	...Disc valve
53.2	..Multiple crankshafts	59.5	..Plural carburetors
53.3	..Cylinders opposite	59.6	..Multiple crankshafts
53.4	...Two-stroke cycle	59.7	..Two-stroke cycle
53.5	..Crankshaft between parallel cylinders	60.1	.Locked annular piston
53.6	.Cylinders having opposing heads		DOUBLE-ACTING
54.1	.Cylinders radiating	61 R	.Two-cycle
54.2	..Star	62	..Combined pump and motor cylinder
54.3	...Cam on rotary output shaft	61 V	..Lengthwise scavenging of cylinders from cylinder head to piston
54.4	.."V" type	63	.Four-cycle
54.5	...Odd number of cylinders	64	SIX-CYCLE
54.6	...Six cylinder	65 R	TWO-CYCLE
54.7	....Eight cylinder	66	.Combined pump and motor cylinder
54.8	....More than eight cylinder	67	.Divided pump discharge
55.1	..Semi-radial	68	.Pump compression
55.2	..Cylinders opposite	69 R	.Separate air and gas pumps
55.3	...Cam on rotary output shaft	69 V	..Lengthwise scavenging of cylinder by gas from cylinder head to piston
55.4	...Four-stroke cycle	70 R	.Pump and cylinder adjacent
55.5	....Cylinders opposite and aligned	70 V	..Lengthwise scavenging of power cylinder
55.6	...Two-stroke cycle	71 R	.Pump and cylinder coaxial
55.7	....Cylinders opposite and aligned	71 V	..Lengthwise scavenging of cylinder from head to piston
56.1	.Having rotary output shaft parallel to cylinders	71 VA	..Sleeve valve
56.2	..Cam on rotary output shaft	72	.Pump and cylinder inclined
56.3	...Swash plate type		.Rear compression
56.4	....Single bank of cylinders	73 R	..Crankcase
56.5	....Motion converting means between two banks of cylinders	73 A	...Fuel to crankcase
56.6	....Multiple swash plate drive	73 AA	...Ported piston
56.7	...Single bank of cylinders	73 AV	....Valved
56.8	..Motion converting means between two banks of cylinders	73 AB	...Inlet valve in head
56.9	...Multiple cam drives	73 AC	...Varies compression space
57.1	..Shaft rotates through piston	73 AD	...Lubricant oil and fuel mixing devices
58.1	.Cylinders in-line	73 AE	...Auxiliary piston moves synchronously with piston to enlarge volume of crankcase or incoming charge
58.2	..Locked pistons	73 AF	...Crankcase compression with auxiliary pump means
58.3	...Two-stroke cycle	73 B	...Fuel to bypass
58.4	..Lengthwise charging	73 BA	....Lengthwise scavenging of cylinders from head
58.5	...Step piston	73 C	...Fuel to cylinder
58.6	..Step piston	73 CA	....Lengthwise scavenging of cylinders from head
58.7	..Cylinder supercharged by pressure pulse of released exhaust gases	73 CB	....With liquid pump to separate inlet
58.8	..Exhaust to next cylinder ready to fire	73 CC	....With gas or vapor pump to separate
58.9	..Oscillating or reciprocating, nonpoppet valve		
59.1	..Rotary valve		
59.2	...Tapered		
59.3	...Sleeve valve		

73 D	...Disc valves	65 P	.Ports
73 DA	...Charge to crankcase through crankshaft	306	MEANS TO WHIRL FLUID BEFORE, UPON, OR AFTER ENTRY INTO COMBUSTION CHAMBER
73 E	...Reentrant cylinder head		
73 F	...Stepped piston	307	.Structural projection on working piston causes whirling
73 FA	...Ported		
73 S	...Supercharging of crankcase	308	.Having multiple oxidant inlet means
73 V	...Valves for crankcase		
73 SC	...Returns charge to crankcase or rejects to exhaust	309	.Specific spark plug location
73 PP	...Distinct passages from crankcase to cylinder	310	COMBUSTION CHAMBER HAVING MULTIPLE SPARK GAPS
73 SP	...Slow-speed operation	311	FOUR-CYCLE
74 R	..Cylinder	312	.Engine cylinder having a reciprocating sleeve valve
74 A	...Fuel to rear of piston	313	..Having a junk ring seal
74 AA	...Lengthwise scavenging from head	314	..Having sleeve valve lubrication means
74 AP	...Reduced portion of piston acts as guide	315	.Multiple exhaust
74 AC	...Cross head between piston and crank	316	.Having subcharger associated with the cylinder
74 AE	...Enclosed crankcase		
74 B	...Lengthwise bypass		
74 C	...Lengthwise cylinder combustion space		
74 D	...Slide valve between chamber of pump and crankcase	317	.Crankcase compression of air or combustible mixture to be subsequently pumped into the working cylinder
65 PE	.Exhaust ports		
65 A	.Inlet and exhaust ports in two or more planes	318	.Rear compression of air or combustible mixture to be subsequently pumped into the working cylinder
65 B	.Pumps	76	.Scavenging
65 BA	.Blowers	77	.Single revolution
65 PD	.Port deflectors	78 R	.Variable clearance
65 E	.Scavenging by inertia of exhaust gas and charging by use of pressure waves	78 A	..Piston in head adjusted mechanically
65 S	.Step piston (see sub. 59 BS)	78 AA	...Piston in head adjusted by fluid means
65 V	.Valves	78 B	..Varying means is in the piston
65 VA	..Sleeve valve	78 BA	...Varying means is in the piston connection
65 VS	..Sleeve driven by auxiliary crankshafts	78 C	..Cylinder or sleeve moved
65 VB	.Lengthwise scavenging list above	78 D	..Auxiliary chamber
65 VC	.Lengthwise scavenging exhaust above	78 E	..Varying means is in the connecting rod
65 VD	.Intake and exhaust valve in top of cylinder	78 F	..Varying means is in the crankshaft
65 W	.Whirl through piston-controlled ports	79 R	.Single poppet valve
65 WA	..Whirl in top of cylinders and lengthwise scavenging	79 A	..Rotary valve and poppet which extends through rotary valve
65 WV	.Vacuum intake	79 C	..Concentric valves; relatively movable
65 SP	.Single port for inlet and exhaust	80 R	.Rotating valve
65 EM	.Exhaust manifolds	80 BA	..Rotary valve is perpendicular to cylinder
		80 BB	..Rotary valve is parallel to cylinder
		80 C	..Sleeve valve

80 D	..Disc valve	337	.Specific throttle valve structure
80 DA	..Rotary plug		
81 R	.Oscillating valve	338	.Fuel injection pump bypass control
81 B	..Oscillating valve - not sleeve or disc	339.1	.Idle speed control
81 C	..Sleeve valve	339.11	..By regulating spark ignition timing
81 D	..Disc valve	339.12	..And air-fuel ratio feedback controlled
82	.Rotating side shaft	339.13	..Manual adjustment
83	.Rotating transverse shaft	339.14	..Electrically operated control means
84	.Adjacent supply and exhaust valves	339.15	...With fail-safe, backup, or malfunction detecting means
85	.Aligned supply and exhaust valves	339.16	...External load condition responsive
86	.Opposite supply and exhaust valves	339.17	...Air conditioner operating mode responsive (i.e., compressor on-off)
87	.Longitudinal valve and lever	339.18	...Accessory load (e.g., lights, heater blower motor, radiator fan motor, generator) on engine electrical system responsive
88	.Transverse valve and lever	339.19	...By engine speed error feedback
89	.Transverse valve and bell crank	339.2	...Dynamic state variable model
319	ENGINE SPEED REGULATOR	339.21	...And integral or derivative control
320	..Responsive to deceleration mode (e.g., engine acting as a brake)	339.22	...And temperature responsive
321	..Valve timing altering means (e.g., axially sliding cam shaft)	339.23	...Controlling throttle bypass
322	...Electrical means adapted to alter valve timing	339.24	...Temperature responsive
323	..Exhaust throttling or blocking	339.25	...Including rotary actuator
324	..Part of the air or combustible mixture to the engine cylinder omitted	339.26	...Stepping motor type
325	..Deceleration responsive cutoff of fuel to engine (e.g., pollution control)	339.27	...Including linear reciprocating solenoid control device
326	..Rich resupply of fuel at end of deceleration	339.28	...Having valve controlled vacuum actuator
327	..Auxiliary air fed to the engine	339.29	..By overriding injection pump governor
328	..Idle jet bypassed by a slight opening of the throttle	342	.Regulator changes length of accelerator linkage
329	..Having means to retard spark (e.g., ignition timing)	343	.Regulator accessory (e.g., cleaner, adjusting tool, etc.)
330	..Engine speed reduction by overriching the combustible mixture (e.g., choking engine)	344	.Charge proportion varying (e.g., the fuel-air ratio is varied)
331	..By electric means	345	.By changing valve lift
332	..Engine speed reduction by fuel cutoff	346	..Intake valve lift altered
333	..By electric means	347	.By changing valve timing
334	..Engine speed reduction by partial or complete omission of the ignition	348	..Intake valve timing altered
335	..By electric means	349	.Having condition responsive means with engine being part of a closed feedback system (e.g., cruise control)
336	..Having plural throttle valve structure	350	..Electrical sensing or regulating

351	...Engine overspeed sensing with an indicator or alarm and speed regulation	382	....Manifold pressure sensor
352	...Engine speed sensing having an error signal producing circuit	383	.....Supercharger
353	....Having variable duty cycle multivibrator (e.g., length of "time on" in each cycle)	384	....Floating piston-type governor (e.g., Bessiere)
354	....Having variable frequency multivibrator (e.g., number of "time ons" per unit of time)	385	....Liquid fluid governor
355	....Having phase difference detector	386	.....Lubrication pressure sensor
356	....Circuit resonates (e.g., tuned) at governed speed	387	.....Fuel pressure sensor
357	....Electric fuel injection pump governor	388	.....Override for basic mechanical governor
358	.....Max-min governor (i.e., no control in between)	389	...Intake manifold vacuum responsive
359	.....Fail-safe feature (e.g., cuts off fuel pump)	390	...Fuel injection pressure governor
360	....Circuit controls a fluid throttle operator (e.g., vacuum)	391	...Responsive to intake airflow
361	....Circuit controls an electric throttle operator	392	...Responsive to cooling fan airflow
362	...Cold engine control	393	...Responsive to exhaust gas
363	..Mechanical sensor or regulator	394	..By combustion air or air-fuel mixture cutoff
364	...Fuel injection pump governor (e.g., diesel)	395	..Open loop condition responsive
365	....Governor override	396	..Resistance or override acts on input connection to regulator
366	.....Engine starting or warm-up control	397	...Shutdown safety device
367	.....Variable throttle or control rod stop	398	...Throttle position lock
369	....Three-dimensional cam control	399	..Having an electrical device between input and speed regulator
370	....Acceleration responsive	400	..Mechanical connection between input and speed regulator
371	....Deceleration responsive	401	..Fluidic device between input and regulator
372	....Biased axial link (e.g., sliding rod with spring return)	402	..Charge volume varying (e.g., total amount of mixture fed to engine is varied; relative amounts of air and fuel are fixed)
373	....Pivoted link connected to pump rack	403	..Throttling (e.g., volume varying using throttle valve)
374	.....Movable fulcrum (e.g., slot and pin)	404	..Suction operated supply valve lift regulating
375	...Fuel injection pressure governor	405	..By engine operated valve
376	...Throttle positioning	406.11	SPARK IGNITION TIMING CONTROL
377	....Safety override of dangerous manual position	406.12	..Electronic control
378	..Fluidic sensor or regulator	406.13	..With fail-safe, backup or malfunction detecting means
379	...Fuel injection pump governor	406.14	...Including spark failure responsive means (e.g., misfire)
380	....Barometric sensor	406.15	...Fuel sensor malfunction responsive
381	....Fuel viscosity sensor (e.g., temperature sensing)	406.16	...Knock control malfunction responsive
		406.17	...Cylinder pressure sensor malfunction responsive

- 406.18 ...Engine shaft rotational position sensor malfunction responsive (e.g., crank shaft, cam shaft)
- 406.19 ..Closed loop feedback control of spark timing
- 406.2 ...Separate control for each cylinder
- 406.21Knock responsive
- 406.22Cylinder pressure responsive
- 406.23 ...Engine output (e.g., torque, speed, horsepower) or fuel consumption optimization
- 406.24 ...Including means responsive to the instantaneous change in engine speed (e.g., roughness, unstable combustion, etc.)
- 406.25Acceleration or deceleration responsive
- 406.26 ...Combustion condition responsive
- 406.27Combustion failure responsive (e.g., misfire)
- 406.28Combustion condition sensed by optical sensor
- 406.29Engine knock responsive
- 406.3Fuel quality or composition signal responsive
- 406.31Alcohol concentration responsive
- 406.32Having a plurality of speed/load maps related to fuel quality or composition
- 406.33With modifying or updating memory (i.e., learning)
- 406.34Modification of knock signal by engine operating condition signal
- 406.35Engine operating condition is load or speed
- 406.36Acceleration or deceleration responsive
- 406.37Having specific knock detecting means
- 406.38Knock frequency distribution pattern responsive
- 406.39Knock signal counting
- 406.4And specific system component mounting or location details
- 406.41 ...Engine cylinder pressure responsive
- 406.42Peak pressure responsive
- 406.43Responsive to derivative, integral or average of pressure
- 406.44 ...Exhaust gas condition responsive control of spark timing
- 406.45 ..Including control of combustible mixture or a constituent thereof (e.g., air, fuel, exhaust gas)
- 406.46 ...Acceleration or deceleration responsive
- 406.47 ...With fuel injection control
- 406.48 ...With exhaust gas recirculation (EGR) control
- 406.49 ..Barometric pressure responsive
- 406.5 ..Acceleration or deceleration responsive
- 406.51 ...Acceleration responsive
- 406.52 ..Throttle position responsive
- 406.53 ..Starting condition responsive
- 406.54 ...Start detected by engine speed
- 406.55 ..Temperature responsive (e.g., ambient, engine, etc.)
- 406.56 ..With magneto
- 406.57 ...And capacitor discharge for ignition spark energy
- 406.58 ..Having engine shaft rotational position signal generator (e.g., crank shaft, cam shaft)
- 406.59 ...Speed responsive timing control
- 406.6Having counter or addressable memory (e.g., digital timing circuit)
- 406.61Plural engine shaft position sensors
- 406.62Position sensors at separate shafts
- 406.63Position sensors having different pulse rates
- 406.64Memory addressed by engine speed or load
- 406.65With microprocessor
- 406.66 ...With resistor/capacitor (RC) timing circuit (e.g., multivibrator)
- 406.67 ..Vacuum timing control
- 406.68 ..Barometric pressure responsive
- 406.69 ..Condition responsive valve in fluid path from vacuum source
- 406.7 ...Temperature responsive
- 406.71 ..Fluid delay between vacuum source and actuator (e.g., fixed restriction)

406.72	..Increasing vacuum retards spark timing	686	...Engine coolant temperature responsive
406.73	..Plural diaphragms or actuators	687	...Speed responsive
406.74	..Mechanical or hydraulic link to throttle valve or accelerator	688	...Inoperative sensor responsive
406.75	..Centrifugal timing mechanism	689	...Engine fluid or engine component temperature responsive
406.76	..Spark delay actuated or deactuated by starting device	690	..With fail-safe, backup, or malfunction means
429	COMBUSTION CHAMBER MEANS COMBINED WITH AIR-FUEL MIXTURE FORMING MEANS	691	..Multiple sensors controlling group of cylinders
430	..Stratification in combustion chamber	692	...Controlling plural groups of cylinders
431	..Having a single combustible mixture inlet combined with means for injecting additional fuel into the combustion chamber	693	..With compensator for sensor output (e.g., current or voltage)
432	..Air or combustible mixture entering the combustion chamber through plural inlets	694	...Output fed to compensating circuit
433	..One inlet is uncovered by piston travel	695	...Variable reference value
434	CHARGE FORMING DEVICE (E.G., POLLUTION CONTROL)	696	...Proportional or integral circuit
435	..Including cylinder pressure or temperature responsive means	697	...Heater for sensor or sensor environment
436	..Including means responsive to instantaneous change in engine speed	698	..With addition of secondary fluid (e.g., fuel or exhaust gas)
672	..Including exhaust gas condition responsive means	699	...Secondary fluid is auxiliary air or oxygen (e.g., carburetor air bleed)
673	..With sensor controlling each cylinder individually	700	...Fed to air/fuel mixture
674	..With modifying or updating memory (i.e., learning)	701	..With auxiliary control of carburetor
675	...Acceleration or deceleration responsive	702	...Variable venturi carburetor
676	..Exhaust gas temperature or pressure responsive	703	..Exhaust gas composition sensor
677	..Combined with ambient condition responsive means (e.g., pressure)	704	..Air/fuel ratio prior to combustion responsive means
678	...Ambient temperature responsive	437	..Auxiliary control of carburetor fuel metering
679	..Combined with engine condition responsive means	438	..By electrical or electronic control system
680	...Idling responsive	439	...Variable venturi carburetor
681	...Engine load responsive	441	..By mechanical speed sensor
682	...Acceleration or deceleration responsive	442	..Injection or carburetion system having a series of throttle valves
683	...Throttle position responsive	443	..Alternate or simultaneous lean-rich
684	...Pressure downstream of throttle valve responsive	444	..Having fluidic logic control means
685	...Starting or warmup responsive	445	..Fuel injection system
		446	..Fuel pump flow regulation
		447	...With accumulator
		448	...Sequential distributor
		449	...Rotary and reciprocating distributor

450	....Rotary distributor	486	....Having a digital memory addressed by an engine parameter
451	....Reciprocating distributor		
452	...Nonsequential distributor	487	....Having an up or up-down counter in circuit
453	....Enrichment of the combustible mixture for cold starting or cold running	488	....Subcircuit operates on a parameter sensor output before input to main fuel control (e.g., function generator)
454	....Equal pressure valve type	490	....Injector solenoid drive
455	....Distributor and metering unit are in common housing	491	....Starting condition responsive
456	....Common rail system	492	....Acceleration or full load condition responsive
457	...Regulating means adjusts fuel pressure	493	....Deceleration condition responsive
458	....Electric regulator	494	....Having specific transducer
459	....Bleed off valve	495	..With fuel pump
460	....Series regulator	496	..Variable rate of injection stroke
461	....Having vapor returned to tank or pump inlet	497	..Electric fuel pump
462	....By throttle control	498	...Piezoelectric drive
463	....Manifold pressure responsive	499	...Solenoid drive
464	....Temperature responsive	500	..Variable beginning and ending of pumping stroke
465	....Barometric responsive	501	..Variable beginning of pumping stroke
466	....Having an antitampering device	502	...Fluid pressure control
467	..Drip prevention means at injector nozzle	503	..Variable ending of pumping stroke
468	..Having a specific shape, material, or location of fuel line	504	..Variable stroke
469	...Specific fuel line mounting means	505	..Fuel pump and intake air controls interconnected
470	..Injection nozzle mounting means	506	..Having pressure relief valve
471	...Nozzle isolated from manifold vacuum effect	507	..Pumping member driven by a piston or valve of the internal combustion engine
472	..Electrically actuated injector	508	..Pumping member driven by the internal combustion engine valve operating mechanism
473	..Mechanically actuated switching	509	..Specific location or mounting of pump
474	....Ignition distributor used as switch	510	..Fuel flow regulation between the pump and the charge-forming device
475	...Actuated by ignition pulse	511	..Regulator means adjusts fuel pressure
476	...Magnetically actuated switching	512	...Engine parameter responsive
477	...Radiation actuated switching	513	...Environmental condition responsive
478	...Actuator circuit (e.g., engine condition responsive electronic circuit actuates injector valve)	514	..Excess fuel returned to tank
479	....Backup systems, fail-safe, failure indicator	515	..Regulator controls flow of a plurality of fuels
480	....Having microprocessor	516	..Air or fuel vapor purging system
481	....Engine cylinder cutout	517	..Carburetor float bowl drain
482	....Circuit activates valve for continuous fuel flow		
483	....Having plural multivibrators		
484	....Having single multivibrator		
485	....Having ramp generator		

518	.Having fuel vapor recovery and storage system	553	..Intermediate fluid used for heating
519	..Having an adsorbent canister	554	..Combustible mixture, air, and fuel are heated separately
520	...Purge valve controlled by engine parameter	555	..Air and fuel heated separately
521	....Responsive to secondary air pressure	556	..Air only
522	..Liquid fuel evaporating by submerged air supply	557	..Fuel only
523	..Liquid fuel evaporating by extended fuel film	558	...Fuel is heated to ignition temperature
524	..Screen or mat	559.1	..Supercharger
525	..Combined liquid and gaseous fuel	559.2	..Pressure exchange with exhaust gas
526	..Diesel engine convertible from liquid to gas	559.3	..With clutch
527	..Gaseous fuel and air mixer	560	..Two-cycle compressor feeds a four-cycle engine
528	..Supercharged engine	561	..Variable ratio compressor driven supercharger
529	..Safety device (e.g., cutoff)	562	..Multiple superchargers
530	..Constant flow fuel supply	563	..Intercooler
531	..Auxiliary air or gas used to inject fuel	564	..Boost control
532	..Air is bled from the cylinder on the compression stroke in that cylinder	565	..Supercharger is driven independently of the engine
533	..Having a separate pump for the air or gas	566	..Funnel-type supercharger (e.g., ram-air)
534	..Air is bled from another engine cylinder	567	..Oxidant is solely oxygen
535	..Constant fuel level	568.11	..Exhaust gas used with the combustibile mixture (e.g., emission control Exhaust Gas Recirculation (EGR) valve)
536	..Combustible mixture ionization, ozonation, or electrolysis	568.12	..Exhaust gas cooled during recirculation
537	..Before intake valve (e.g., in manifold)	568.13	..Having recirculation path formed entirely in the cylinder block or head
538	..Fuel only	568.14	..Internal exhaust gas recirculation (e.g., exhaust gas retained in the combustion chamber)
539	..Air only	568.15	..Having exhaust gas mixed with a constituent before entry into intake manifold
540	..Cooling of combustibile mixture	568.16	..With electrical means for fail-safe, backup, or malfunction detecting of EGR system
541	..Fuel only	568.17	..Having specific exhaust gas outlet structure at intake manifold
542	..Air only	568.18	...Having a valve located at the outlet of the EGR passage
543	..Heating of combustibile mixture	568.19	..EGR valve position controlled only in relationship to intake throttle valve position
544	..Lighter fuel is used during starting	568.2	..Plural EGR valves in the recirculation passage
545	..Heating medium surrounds combustibile mixture		
546	..Combustibile mixture surrounds heating medium		
547	..Combustibile mixture and heating medium adjoin one another		
548	..Trap for liquid particle vaporization		
549	..Electric heater		
550	..Combustion heater		
551	...Part of combustibile mixture is burned		
552	..Automatic control		

568.21	..Having electrically actuated control means	588	..Oxidant controlled by engine temperature
568.22	...Ambient condition responsive (e.g., atmospheric temperature, atmospheric pressure)	590	.Charge-mixing device in intake (e.g., device which insures the atomization of the combustible mixture)
568.23	..Having rotary actuator control of EGR valve	591	..Having liquid fuel collector
568.24	...Electrical rotary actuator rotates the EGR valve	592	..By fan means
568.25	...Vacuum actuator control of EGR valve	593	..By screen means
568.26	..Having electromechanical actuator control of EGR valve	594	HIGH TENSION IGNITION SYSTEM
568.27	...Controlling vacuum actuator	595	.Retrofit conversion ignition unit
568.28	....Including auxiliary vacuum pump	596	.Using capacitive storage and discharge for spark energy
568.29	..Vacuum actuator control of EGR valve	597	..Regulating sensed ignition capacitor voltage
568.3	...Including auxiliary vacuum pump	598	..Having an oscillator
568.31	...Temperature responsive	599	..Having a magneto
568.32	..Having fixed restriction in vacuum line	600	...Triggering voltage obtained from capacitor charging winding
572	.Crankcase vapor used with combustible mixture	601	...Specific design of charge or trigger winding core
573	..Vapor treated before mixing with combustible mixture (e.g., cooling)	603	...Antireverse protection
574	..Specific control valve (e.g., PCV valve)	604	..Inductive capacitive discharge system
575	.Diverse fuel supply	605	..Having a specific capacitor, ignition coil means, or switching element circuit path
576	..Fuel switched in response to engine starting condition	606	.High frequency ignition system
577	..Fuel switched, condition responsive to load	607	..Free running oscillator supplies coil primary
578	..Fuel switched in response to engine temperature	608	..Having a specific spark plug
579	.Multiple carburetors	609	.Having dwell control
580	..Each carburetor feeds a cylinder or group of cylinders (e.g., split engine)	610	..Using a monostable multivibrator
581	..Separate carburetor for starting	611	..Dwell maintained at constant value
582	..Separate carburetor for high load	612	.Having engine component position sensor
583	..With linkage between carburetor throttle valves	613	..Optical sensing
584	...Staged opening of carburetor throttle valves	614	..Including a zero crossing detector
585	.Auxiliary air or oxygen added to combustible mixture	615	..Including an oscillator
586	..Oxidant controlled by throttle	616	..Piezoelectric sensor
587	..Oxidant controlled by intake manifold vacuum	617	..Inductive or magnetic sensor
		618	.Having specific trigger circuitry
		619	..Oscillatory trigger circuit
		620	.Additional spark energy supply
		621	.Having an ignition coil with multiple primary or secondary windings
		622	..Separate circuit for each winding

623	.Having supply voltage regulation	653	..Additional capacitor other than breaker point capacitor is in series with coil primary or secondary
624	.Having ballast resistor cutout or control		
625	..Responsive to engine or environmental condition	654	..Additional capacitor other than breaker point capacitor is in parallel with coil primary or secondary
626	..Oscillator or trigger circuit responsive to engine condition		
627	.Having auxiliary spark gap in series or parallel with the coil	655	..Diode is in series with coil primary or secondary
628	.Having a continuous high voltage output to the high voltage distributor	656	..Diode is in parallel with coil primary or secondary
629	.Monostable multivibrator controls timing of coil primary current	90.1	POPPET VALVE OPERATING MECHANISM
		90.11	.Electrical system
630	.Safety device	90.12	.Hydraulic system
631	..Reverse engine rotation protection	90.13	..With manifold and distributor
632	..Ignition switch opened when engine stops	90.14	.Pneumatic system
633	.Radio interference protection	90.15	.With means for varying timing
634	.Having a specific ignition coil	90.16	..Cam-to-valve relationship
635	.Specific coil location	90.17	..Camshaft or cam characteristics
636	.Multiple spark ignition system	90.18	...Axially shiftable camshaft
637	..System fires single spark plug per cylinder	90.19	.With temperature compensation
638	..System fires multiple spark plugs per cylinder	90.2	.With compound movement of cam follower
639	..System using vibrator for multiple sparks upon starting	90.21	.Follower displaced axially of camshaft
640	.Dual systems	90.22	.Plural valve trains, single actuator
641	..One for starting	90.23	..Intake and exhaust
642	.Piezoelectric voltage generator	90.24	.Valve driven closed
643	.Electronic cylinder sequencing	90.25	..By valve-opening rocker
644	.Current or voltage sensing in coil primary	90.26	..By cam-actuated unitary follower
645	.Maverick spark suppressor	90.27	.Overhead camshaft
646	..Point bounce or arc suppression system	90.28	.With nonvalving movement (e.g., about valve stem)
647	.Having a specific mounting of system component	90.29	..Oscillating movement converted internally
648	.Having SCR triggered by lowering cathode voltage below ground	90.3	..Positive rotation provided by internal means
649	.Multiple primary current interrupters	90.31	.Camshaft drive means
650	.Power supply, ignition coil primary, and interrupter element all in series	90.32	.With alternate interruption of drive train
651	..Interrupter is multiple transistor circuit	90.33	.Lubrication
652	..Interrupter is single transistor	90.34	..Camshaft
		90.35	..Tappet as conduit
		90.36	..Rocker fulcrum as conduit
		90.37	..Seals and shields
		90.38	..Housings
		90.39	.Rocker
		90.4	..Plural valves
		90.41	..Individually fulcrumed
		90.42	...Rotation prevention
		90.43	...Lash adjustment at fulcrum
		90.44	..Cam engaged

- 90.45 ..Lash adjustment
- 90.46 ...Hydraulic
- 90.47 ..Yieldable engagement
- 90.48 .Tappet
- 90.49 ..Cushion and silencer
- 90.5 ..Rotation prevention
- 90.51 ..Composition, surface treatment manufacture
- 90.52 ..Lash adjustment
- 90.53 ...Self-operating
- 90.54Screw
- 90.55Hydraulic
- 90.56Pressure flow upwardly into pressure chamber
- 90.57Vent or bleed means for pressure chamber
- 90.58Self-contained
- 90.59With provision for horizontal positioning
- 90.6 .Cam
- 90.61 .Rod
- 90.62 ..Self-adjusting
- 90.63 ..Hydraulic
- 90.64 ..Pull type
- 90.65 .Spring
- 90.66 ..Attenuated
- 90.67 ..Seat and retainer
- 143 R **IGNITERS**
- 144 .Flame
- 145 R .Incandescent
- 146 ..Valve controlled
- 145 A ..Electric (incandescent ignitors using electricity as a source of heat)
- 146.5 R .Sparkers
- 147 ..Low tension
- 149 R ..Dynamos
- 149 A ...Inductor type
- 149 B ...Impulse starters
- 149 D ...Flywheel type
- 149 E ...Oscillating armature type
- 149 F ...Special waveforms
- 149 FADouble current generators
- 149 G ...Movable pole shoes and bell-magnets
- 149 H ...Reciprocating
- 150 ..Combined adjusting and exhaust regulating
- 151 ..Combined sparker and valve
- 152 ..Combined valve and sparker operating
- 169 R ..Plugs
- 169 CL ...Cleaners automatic
- 169 CMCleaners manual
- 169 CA ...Compound insulation
- 169 CB ...Core retaining
- 169 DW ...Disk wrappings type
- 169 EL ...Electrodes
- 169 EA ...Adjustable gap
- 169 EB ...Replaceable electrode
- 169 EC ...Adjustable and replaceable
- 169 C ...Cool
- 169 E ...Insulated electrodes
- 169 G ...Intensity in gap only
- 169 P ...Insulating protecting
- 169 PATubes and attachments
- 169 PBHeaters
- 169 PHHoods and shields
- 169 MG ...Multiple firing gap
- 169 TC ...Transparent combustion chamber
- 169 V ...Valved
- 153 ..Make and break
- 154 ...Electromagnetic
- 155 ...Pneumatic
- 162 ...Piston-operated
- 156 ...Reciprocating electrode
- 157 ...Rocking-electrode hammer action
- 158 ...Rocking and rigid electrodes
- 159 ...Rocking and yielding electrodes
- 160 ...Oscillating electrodes
- 161 ...Rotary electrodes
- 163 ...Stationary-electrode structure
- 164 ...Adjusting mechanism
- 146.5 A ..Timers
- 146.5 B ..Ignition locks
- 146.5 C ..Fluid level or pressure-actuated ignition switches
- 146.5 D ..Devices for opening the ignition circuit when engine stops in order to save battery
- 143 A .High compression igniters
- 143 B .Special charge igniters
- 143 C .Insulated casing enclosing wires leading to plugs, distributor, etc.
- 192.1 **VIBRATION COMPENSATING DEVICE**
- 192.2 .Balancing arrangement
- 197.1 **TRANSMISSION MECHANISM FROM PISTON**
- 197.5 .Including clutch
- 197.2 .With particular piston
- 197.4 .Crankshaft and connecting rod
- 197.3 ..Particular connecting rod
- 179.1 **STARTING DEVICE**
- 179.2 .Remote control

179.3	.Condition responsive control of starting device	185.13	...Means provided to prevent counter rotation of crank
179.4	..Including automatic engine stop	184.1	.With auxiliary igniters
179.5	.Control of spark ignition during starting	184.21	INTAKE MANIFOLD
179.6	.Control of glow plug during starting	184.22	.Passage to crankcase
179.7	.Auxiliary fuel supply device	184.23	..For use with carburetor upstream of manifold
179.8	..Starting fluid	184.24	..Manifold having plenum
179.9	..Priming means	184.25	...Plural plenums
179.11	..Manual pump device or squeeze bulb	184.26	....Interconnection between plenums
179.12	...Condition responsive	184.27	..Multiple passage leading to inlet of head
179.13	....Temperature	184.28	.For engine having radiating cylinders
179.14	..Condition responsive	184.29	..Star-type engine
179.15	...Temperature	184.31	..For V-type engine
179.16	.With fuel or intake air control	184.32	...For use with carburetor upstream of manifold
179.17	..Fuel injection pump	184.33	....Inlet manifold heated by outlet manifold
179.18	..Intake air control	184.34	...Manifold having plenum
179.19	.Includes auxiliary internal combustion engine	184.35	....Plural plenums
179.21	.With charge or cylinder heating	184.36	....Interconnected between plenums
179.22	.Inertia type	184.37	...Multiple passage leading to inlet of one cylinder
179.24	.Either power or manual starting device	184.38	.For in-line engine
179.27	.For airplane	184.39	..For use with carburetor upstream of manifold
185.7	..Manual type	184.41	...Intake manifold heated by outlet manifold
179.28	.With electric generating means	184.42	..Manifold having plenum
179.29	..Auxiliary magneto	184.43	...Plural plenums
179.31	.Having fluid-driven starting motor	184.44	....Interconnection between plenums
183.1	.Gunpowder type	184.45	..Multiple passage leading to inlet of one cylinder
182.1	.Compression relieving type	184.46	.For use with carburetor upstream of manifold
179.25	.Having specific mounting or drive connection for electric starter motor	184.47	.Manifold having plenum
179.26	..For nonoperator supporting wheeled platform	184.48	..Plural plenums
185.1	.Mechanical	184.49	...Interconnection between plenums
185.14	..Includes mechanical potential motor (e.g., spring motor)	184.51	..Adjustable plenum
185.15	...Operated by wheels of vehicle	184.52	.Multiple passage leading to inlet of one cylinder
185.2	..Includes cable	184.53	.Manifold tuning, balancing or pressure regulating means
185.3	...Including recoil mechanism	184.54	..With back flow prevention valve
185.4	....Lever connected to the cable	184.55	..Adjustable length passage
185.5	..Includes lever or slide linkage	184.56	..Adjustable cross section passage
185.6	...Lever or slide actuates a gear segment	184.57	..Resonator chamber
185.8	..Includes friction means in linkage		
185.9	..Includes coaxial cooperating threaded members in linkage		
185.11	..Includes worm gear in linkage		
185.12	..Including crank-type handle		

- 184.58 ..Return loop to inlet
- 184.59 ..Interconnection between passages
- 184.61 .Manifold material or composition
- 142.5 R **WITH HEATING MEANS**
- 142.5 E .Electric heaters for heating cooling system
- 657 **COMBUSTION CHAMBER**
- 658 .L- or T-shaped
- 659 .Having groove to aid combustion
- 660 .An acoustic cavity used to attenuate detonation shock waves (e.g., Bodine)
- 661 .Having squish area
- 662 .Multiple annular combustion chambers
- 663 .Annular combustion chamber
- 664 .Combustion chamber shape is a figure of revolution
- 665 ..Spherical
- 666 ..Hemispherical
- 667 .Asymmetric combustion chamber
- 668 .Having coating or liner
- 669 ..With means for mounting coating or liner
- 670 .Having catalytic combustion aid
- 671 .Cylinder head shape conforms to piston shape
- 193.1 **PARTICULAR PISTON AND ENCLOSING CYLINDER CONSTRUCTION**
- 193.5 .Cylinder head
- 193.3 ..Having detail of connection to other cylinder structure
- 193.6 .Piston
- 193.4 ..Having detail to guiding structure cooperating with cylinder
- 193.2 .Cylinder detail
- 188.1 **VALVE**
- 189 .Detachable
- 188.14 .Valve head cooperates with manifold
- 188.4 .Reciprocating valve
- 188.15 ..Shepherd type
- 188.2 ..Poppet
- 188.16 ...Pivoted
- 188.3 ...Material or structure
- 188.5 ..Sleeve
- 190.1 .Rotary
- 190.12 ..Sleeve
- 190.13 ...With lubrication means
- 190.3 ..For crankcase
- 190.4 ..Double function type
- 190.5 ...For two or more cylinders
- 190.6 ...Elongated rotary double-function valve
- 190.7Tapered
- 190.8 ...In horizontal plane above cylinder
- 190.9Tapered
- 190.11 ...In horizontal plane on the side of the cylinder
- 190.14 ..Disc, cone, or sphere shaped
- 190.15 ...Controls plural cylinders
- 190.2 ..Single function, (i.e., exhaust and intake by separate tube)
- 190.16 ..Lubricant
- 190.17 ..Seal
- 188.6 .Packing
- 188.7 .Combustion improving accessory
- 188.8 .Valve seat relation
- 188.9 .Guide, lubricant, or coolant
- 188.11 .Wear feature
- 188.12 ..For spring
- 188.13 ...Including attaching means
- 188.17 .Having actuation springs concentric with valve stem
- 195 R **FRAME CONSTRUCTION**
- 195 A .Auxiliaries, brackets
- 195 C .All covers
- 195 E .Electrical
- 195 P .Outboard motor frames
- 195 S .Sheet metal frames
- 195 AC .Inclined cylinder
- 195 H .Horizontal stress members
- 195 HC .Horizontal cylinder
- 196 R **LUBRICATORS**
- 196 A .Filtering
- 196 CP .Crankcase, pressure control
- 196 AB .Heating and cooling
- 196 M .Upper cylinder lubricants
- 196 S .Safety devices
- 196 V .Sleeve valve lubrication
- 196 W .Vertical shaft
- 198 R **ACCESSORIES**
- 198 A .Decarbonizers and antiknocks
- 198 B .Antitheft valves and locks
- 198 C .Pumps
- 198 D .Safety devices
- 198 DA .Bearing wear, cylinder, oil drain, auto ignition
- 198 DB .Fuel cut-off
- 198 DC .Ignition cut-off control
- 198 E .Covers, trays, vibrators, corrosion inhibitors, air filters
- 198 F .Cylinder cut out

198 P .Pressurizing - crankcase, clutch housing, transmission housing

FOREIGN ART COLLECTIONS

FOR 000 CLASS-RELATED FOREIGN DOCUMENTS

Any foreign patents or non-patent literature from subclasses that have been reclassified have been transferred directly to FOR Collections listed below. These Collections contain ONLY foreign patents or non-patent literature. The parenthetical references in the Collection titles refer to the abolished subclasses from which these Collections were derived.

STARTING DEVICE

FOR 100 .Spark delaying (123/186.1)
 FOR 101 **SPARK IGNITION TIMING CONTROL (123/406)**
 FOR 102 .Vacuum timing control (123/407)
 FOR 103 ..Multiple diaphragms (123/408)
 FOR 104 ..Fluid delay in fluid path line from vacuum source (123/409)
 FOR 105 ..Including sensor responsive to barometric pressure to alter vacuum level (123/410)
 FOR 106 ..Increasing vacuum retards the spark (123/411)
 FOR 107 .Barometric pressure responsive controller (123/412)
 FOR 108 .By mechanical or hydraulic link to throttle valve or accelerator (123/413)
 FOR 109 .Having engine shaft position sensor (123/414)
 FOR 110 .Analog electronic control (123/415)
 FOR 111 .Digital electronic control (123/416)
 FOR 112 ..Having microprocessor (123/417)
 FOR 113 .Speed responsive (123/418)
 FOR 114 ..Responsive to instantaneous changes in engine speed (e.g., roughness) (123/419)
 FOR 115 ..Centrifugal timing mechanism (123/420)
 FOR 116 .Ambient or engine temperature responsive (123/421)

FOR 117 .Acceleration responsive (123/422)
 FOR 118 .Deceleration responsive (123/423)
 FOR 119 .Starting or cold running condition responsive (123/424)
 FOR 120 .Cylinder pressure or cylinder temperature responsive (123/425)
 FOR 121 .Feedback correction (123/426)
 FOR 122 .Timing control derived from ignition capacitor (123/427)
 FOR 123 .Having circuit that alters response of an oscillatory engine shaft position sensing circuit (123/428)
 FOR 124 .Exhaust gas used with the combustible mixture (e.g., emission control (e.g.r. valve) (123/568)
 FOR 125 ..Diesel engine (123/569)
 FOR 126 ..Exhaust gas cooled before recirculation (123/570)
 FOR 127 ..Electrical control of e.g.r. valve (e.g., between exhaust gas and intake manifold) (123/571)
 FOR 128 ...Having controllable timing means (123/602)

DIGESTS

DIG 1 **INTERCHANGEABLE**
 DIG 2 **ACCUMULATED FUEL RETURN TO TANK OR ENGINE-INDUCTION SYSTEM**
 DIG 3 **MODEL**
 DIG 4 **STRATIFICATION**
 DIG 5 **CRANKCASE PRESSURE-OPERATED PUMPS**
 DIG 6 **DETACHABLE**
 DIG 7 **CONVERTIBLE**
 DIG 8 **MULTIPLE ENGINE UNITS**
 DIG 9 **FLAME IGNITION**
 DIG 10 **FLUIDIC AMPLIFIER FUEL CONTROL**
 DIG 11 **ANTIDIESELING (STOPPING)**
 DIG 12 **HYDROGEN**
 DIG 13 **GAS**