1 **COMBUSTION BURSTS OR FLARE-UPS IN PULSES OR SERIAL PATTERN**
2 **PROCESS OF COMBUSTION OR BURNER OPERATION**
3 .Decarbonizing, cleaning or purging
4 .Feeding flame modifying additive
5 .Burning waste gas, e.g., furnace gas, etc.
6 .Starting or shutdown procedure
7 .In a porous body or bed, e.g., surface combustion, etc.
8 .Flame shaping, or distributing components in combustion zone
9 ..Whirling, recycling material, or reversing flow in an enclosed flame zone
10 ..Oxidizer added to region of incomplete combustion
11 .Heating feed
12 .Controlling or proportioning feed
13 **WITH INDICATOR OR INSPECTION MEANS**
14 .Correlated with action of condition responsive burner control
15 ..Shutdown or aborted start attempt indicated
16 ...Responsive to gas leakage, overflow, abnormal pressure or electrical component malfunction
17 .Burner component position indicator
18 **TIMER, PROGRAMMER, RETARDER OR CONDITION RESPONSIVE CONTROL**
19 .Responsive to combustion chamber pressure
20 .Of or by exhaust damper or exhaust pump
21 .By combustion destructible element, e.g., fusible plug, etc.
22 .By sensing of gas leakage, flashback or escaped flame
23 .Of means protecting burner component from combustion heat
24 .With test circuit checking or analyzing flame sensing circuit for malfunction
25 ..Utilizing unidirectional electrical conducting effect of flame
26 ..Test circuit activated, then inactivated in starting
27 .Providing repeated start attempts prior to shutdown upon failure to establish combustion
28 .Actuation sequence of electric feed heater and feed flow controller or igniter
29 .Control of purger, of scavenger or of combustion start-up delay period
30 ..Of scavenging or purging pump
31 ...Scavenging or purging period started by combustion demand
32 .Of cleaning means
33 .Of extinguishing means
34 ..Wick cover actuated in response to tilting of burner
35 ..By candle length or fuel quantity
36 .Of or by burner feed supply heating structure
37 ..By controlling admittance of feed to structure
38 ...By pressure of feed in structure
39 ...By level of liquid feed in structure
40 ...By linear expansion of feed holder
41 ..Supply of heat to heating structure controlled
42 .Sensor of first burner controls second burner, e.g., pilot and main, etc.
43 ..With electrical igniter
44 ...Igniter deenergized by fuel pressure variation in start effort
45 ...Igniter deenergized by timer, programmer or retarder
46 ...Igniter deenergization responsive to first burner ignition
47 ...With manual igniter actuation
48 ..Sensor of second burner controls third burner
49 ..And an igniting burner for first burner
50 ..Sensing of flame at both burners required for continued operation of second burner

51 ..Both burners cut off upon sensed extinguishment of first burner
52 ...First burner manual reset valve cut off
53 ....Single valve cuts off branched flow
54 .....Reset includes structure preventing feed to second burner prior to sensed combustion at first burner
55 ....Burners independently controlled by reset valves
56 ...Having cut-off valve by-pass or additional supply to first burner
57 ..Manual reset of second burner required upon first burner extinguishment
58 ..Sensor controls diaphragm motor of second burner valve
59 ..Electrical or magnetic sensor controls second burner
60 .Of sequential operation of plural burners, e.g., pilot and main, etc.
61 ..By fuel feed pressure variation
62 .Of diverse feed or feed rate in starting, e.g., enriching fuel mixture in starting, etc.
63 ..Combustion sensor establishes "run" feed
64 .Level responsive means controls fuel level in wick pot or pot type burner
65 .Fuel feed cut off by collected fuel over-flow
66 .Sensor of electrical condition or temperature of electrical igniter controls fuel feed
67 .Igniter heat up and fuel feed sequence controlled by timer or retarder
68 .Sensing of hot combustion zone condition blocks restart attempt
69 .Shutdown by sensed absence of flame in proving period
70 ..Recycle through proving period on sensing of failure of established flame
71 ..Igniter cut off when flame establishment proved
72 .Of igniter and feed controlled sequence
73 ..By timer or retarder
74 ..Combustion zone sensor controls igniter
75 .By combustion or combustion zone sensor
76 ..Combustion product composition sensor
77 ..Of shutdown by response to sensed combustion failure or overheat
78 ...By electrical control circuit
79 ....Photoelectric sensor
80 ....Thermoelectric generator sensor
81 ...Manual setting means for biased valve released upon sensed combustion
82 ...With fuel feed means downstream of shutdown valve
83 ...Sensor movement losses means holding shutdown valve open against bias
84 ....Held by latch, latch released by sensor
85 .....Expanding fluid sensor
86 .By manually started timer or retarder, or by time of day device
87 ..Of combustion initiating means, e.g., match striker, etc.
88 .By tilting, jarring, or mechanical damage
89 .By condition of burner feed or feed means
90 ..Sensor of one feed controls another feed
91 **PROJECTOR AND IGNITER FOR LIQUID OR GELLED FUEL SLUG OR ROD, E.G., FLAME THROWER, ETC.**
357 **ILLUMINATING FLASH DEVICE, E.G., PHOTOGRAPHIC BULB, ETC.**
358 .Fuel charge within sealed transparent casing, e.g., bulb
359 ..Plurality of bulbs associated for sequential ignition
360 ..Coated casing
361 ..Percussive ignition means ignites charge
362 ..Electrically ignited primer ignites charge
363 .Having fuel charge feeding means
364 .Having protective shield

365 .Electrical means ignites charge
99 **MAGNESIUM STRIP**
100 **INCANDESCENT MANTLE**
101 .Resiliently supported
102 .Wick feeds vapor to mantle
103 .Heated feed line section
104 ..Discrete flame holder heats section, e.g., auxiliary jet, etc.
105 ..Within mantle
106 ..Above upwardly fed mantle
107 ..Heated by downwardly fed mantle
108 .Distinct means increases pressure at mantle
109 .Depends below downwardly facing fuel discharger
110 .Supported above upwardly facing fuel discharger
111 .Supporting or protecting means external of mantle
112 ..Extending within mantle
113 ..On upwardly opening mantle
114 **WITH MEANS ATTENUATING SOUND OR PULSATION**
115 **COMBUSTION PRODUCTS RETURN STRUCTURE**
116 .Recirculation about mixing or combustion chamber wall or baffle
117 **WITH EXTERNAL DRAIN FOR SURPLUS LIQUID FUEL DISCHARGED INTO VAPORIZATION OR COMBUSTION ZONE**
118 .Drained collecting basin spaced from zone
119 **WITH DRIP OR LEAKAGE COLLECTOR**
120 **WITH WICK TRIMMING, TREATING, INSERTING, OR REMOVING MEANS**
121 **WITH APPARATUS CLEANING, PURGING OR SCAVENGING MEANS**
122 .Scraping or clearing member
123 ..Feed orifice penetrating
124 **WITH RESERVE FLINT HOLDER**
125 **WITH SIMULATION FEATURE**
126 **WITH ORNAMENTATION OR FLAME COLORING ADDITIVE**
127 **BURNER ASSEMBLY INCLUDES IGNITER ELEMENT AND REMOVABLE HAND MANIPULATABLE TORCH**
128 .Electrical igniter
129 **BURNER HEAD COVER OPERATIVELY INTERRELATED WITH IGNITER**
130 .Interconnected with valve in fuel feed passage
131 ..By movably mounted burner nozzle
132 .Electrical igniter
133 .Solid ignition charge dispenser and striker
134 .Actuation of ignition member releases biased open cover
135 .Cover, latched closed, biased open; igniter actuated on release
136 ..Abrasive wheel moves with cover about a common axis
137 .Cover actuator cocks and releases abrasive member drive
138 .Common axis for cover and abrasive wheel
139 ..Actuator (e.g., finger piece) engaged with cover for relative movement
140 ...Gear drive between cover and actuator
141 .One way drive means between cover and abrasive wheel
142 **BURNER HEAD OR IGNITER REMOVABLY SECURED TO FUEL TANK BY ENCIRCLING FRAME OR CASING**
143 .Burner head on tank and igniter on frame or casing
144 **BURNER CAP, COVER OR EXTINGUISHER**
145 .Fluid
146 .Movably or removably mounted cover for flame holder
147 ..Cover bars oxidizer from catalyst
148 ..Connected to lamp chimney or its support
149 ..And distinct snuffer within cover
150 ..Cover operatively interconnected with feed controller or feed pump
151 ..And windshield within covered zone
152 ..Pivotally mounted
153 **CORRELATION OF FUEL OR POWER SUPPLY WITH COMPONENT MOVEMENTS IN A DISABLING AND ENABLING SEQUENCE**
154 **WITH REPAIR, ASSEMBLY OR DISASSEMBLY ADJUNCT**
155 .Slide or roller
156 **CONVERTIBLE**
157 **MEANS AT CHAMBER OUTLET ESTABLISHING COMBUSTION PRESSURE DISTINCT FROM AMBIENT**

158 .Chamber outlet forms jet nozzle
159 **FUEL DISPERSER INSTALLED IN FURNACE**
160 .Disperser cooled by fluid additional to furnace feed
161 .Furnace heated feed line section
162 ..Distinct sections feeding disparate fluids to furnace
163 ..Section feeds steam to disperser
164 ..Section feeds oxidizer through furnace wall opening spaced from that for disperser
165 ...Oxidizer fed at spaced points along combustion path
166 ..Section feeds oxidizer to disperser or through disperser furnace wall opening
167 ...Section is furnace wall cavity leading to disperser
168 .Rotary disperser projects at surrounding flange surface
169 ..Mixing ring or group of deflectors overhangs flange surface
170 .Disperser feeds into permeable mass, e.g., checkerwork, etc.
171 .With discrete flame directing baffle
172 ..Baffle means forms flame ring around combustion chamber
173 .Feed projected tangential to wall of circular combustion chamber
174 .Spaced fuel dispersing orifices within furnace
175 ..Intersecting fuel streams
176 ...Opposed rows of streams of radially directed streams in a common plane
177 ..Annular arrangement with fuel directed on surrounding combustion chamber wall
178 ..Row with parallel discharge through combustion chamber wall
179 ...Longitudinally adjacent rows
180 ..Row across combustion chamber
181 .Plural feed means extending to common wall opening of furnace
182 ..Duct with air whirling means surrounds disperser
183 ...Row of stationary blades coaxial with disperser whirls air
184 ....Pivotally adjustable blades
185 ..Feed whirling means at wall
186 ..Shiftably mounted disperser; or flame shaper
187 ..Feeds discharged coaxially
188 ...Air chamber with inlet control surrounds disperser at wall
189 .Disperser adjustably mounted for movement relative to furnace wall opening
190 .Water, air or steam feeder spaced from disperser
191 **BURNER IGNITED BY FLASH FLAME THROUGH CONDUIT**
192 .Conduit feed means spaced from ignited burner
193 .Unique burner manifold orifice feeds conduit
194 ..Nipple forms orifice and anchors conduit
195 **FUEL DISTRIBUTOR UNDERLYING COMBUSTION ANNULUS HAVING AIR FEEDING PERFORATIONS**
196 .With pilot burner, primer, or electric combustion starter
197 .Annulus movably mounted for access to distributor
198 .Distributor annulus feeds combustion annulus through coaxial throat or row of orifices
199 .Distributor receives heated fuel from annulus heated line section
200 .Coaxial combustion chambers with intermediate air space
201 .Structure surrounding annulus guides combustion air to perforations
202 **STRUCTURAL INSTALLATION**
203 **FLAME HOLDER MOUNTED ON HEATED SINGLE CHARGE FUEL TANK**
204 .Fuel jet from heated tank traverses wick burner
205 .Priming cup heats tank
206 .Having heat conductor between spaced flame holder and tank
207 **HEATED LINE SECTION FEEDS FLAME HOLDER**
208 .Electrically heated section
209 .Section and its heat source mounted for relative movement, e.g., to vary thermal effect, etc.

262 ...Resistance type heater or igniter
263 .Igniter in shelter chamber
264 .Spark electrode in front of or adjacent fuel discharger
265 ..Gun type burner with electrode supported in air blast conduit
266 ..Spark circuit includes feed terminus
267 **FRICTIONAL, CHEMICAL OR PERCUSSIVE TYPE IGNITER**
268 .Catalytic
269 .Cap, match or pellet igniting charge holding and firing means
270 ..Externally accessible operator fires charge within flame enclosure
271 ..Plural charge holder with presenting structure
272 ...Serially connected charges
273 .Spark projecter, e.g., flint and abrasive striker, etc.
274 ..Mechanical movement operated abrasive member
275 ...Stored energy actuated; detent, latch or overcenter release
276 ..Advancing type flint holder
277 ..Mounted on fuel tank adjacent flame holder
278 **SEPARATELY SUPPLIED OR CONTROLLED, PHYSICALLY RELATED FLAME HOLDERS, E.G., DIVERSE FUELS, PILOT AND MAIN, ETC.**
279 .Relatively movable
280 .By multiway valve
281 .Correlated controls
282 .Adjustable wick
283 .Three mounted in cross igniting relationship
284 .Coaxial
285 .Having common flame chamber or shield means
286 **DISCRETE MEANS TRANSMITTING FLAME BETWEEN SEPARATE FLAME HOLDING SECTIONS**
287 **HAVING COMBUSTION STARTING ASSISTANT**
288 **CANDLE, E.G., TAPER, ETC.**
289 .Having structure additional to wax and wick
290 ..Height adjuster or maintained flame level
291 ..Fuel body totally within casing, e.g., vigil light, etc.
292 ..Melt handler or receiver
293 ...Follower cap
294 ...Drained or openwork candle grip mounted on melt receiver
295 ..Holder for plural candles
296 ..Hook, clamp or spike supported candle holder
297 ..Candle mounting attachment for socket type support
298 **FIBROUS WICK TYPE FLAME HOLDER**
299 .Having feeder or holder for disparate fluid
300 .Means forcing air into flame area
301 .Wick movement limiting structure
302 .Tubular wick having central supporting and air supplying structure
303 ..Having lateral air inlet passage through wick
304 ..Having wick raiser
305 ...Screw thread on wick carrier
306 ...Rotatable threaded rod and follower
307 ...Rack and pinion
308 ...Reciprocated bar
309 ..Having air guide or distributor
310 .Having air or flame director, air distributor, or windguard
311 ..Transparent director surrounding wick support or guide
312 ..Director passageways, each surrounding wick or flame zone
313 ..Director passageways leading to flame zone
314 ..Air annulus leads to flame zone
315 .Having adjustable wick exposure, position, or porosity setting structure
316 ..Rotatable projection means engages wick
317 ...Transmission mechanism rotates means
318 ...Opposed rotatable wick engaging means
319 .Having distinct fuel line between reservoir and wick guide or support means
320 .Liquid fuel container carries wick guide or support

321 ..Having distinct container filling or venting structure
322 ..Means supporting displaced wick guide or support on fuel container
323 ..Having absorbing, baffling or additional wick supporting structure in container
324 ..Detachable closure securing guide to container
325 .Coated, impregnated, layered, coupled or reinforced wick
326 **POROUS, CAPILLARY, PARTICULATE OR SIEVELIKE FLAME HOLDER, E.G., RADIANT SURFACE BURNER, ETC.**
327 .Capillary mass having handle
328 .Means supplying fuel for passage through the flame holding structure, e.g., radiant surface burner
329 ..Woven screen holds flame
330 **DRIP, TRICKLER, OR SHELF-TO-SHELF TYPE BURNER**
331 **POT TYPE BURNER**
332 .Having feeder or holder for disparate fluid
333 .Having means for continuously feeding fuel
334 ..With pot or fuel reservoir elevating means
335 ..Air feed passage through bottom of pot
336 ..Ring structure at pot outlet forms central vertical discharge throat
337 ...Structure includes radial air feed passages discharging at throat
338 ..Having baffling means within pot confines
339 ...Forms separate zones of combustion at fuel surface
340 ...Horizontally extending partition having central passage
341 .Including exhaust flue having air feed passages
342 ..And baffling means within pot
343 **WITH SUPPORTING BRACKET, LEG, HOOK, STRAP OR CLIP**
344 **FLAME HOLDER AND FUEL TANK ASSEMBLY**
345 **FLAME HOLDER HAVING ATTACHED HANDLE**
346 **FLASH-BACK CONTROLLING OR PREVENTING STRUCTURE**
347 **INCANDESCING OR REFLECTING COMPONENT, E.G., REIGNITING HOT SPOT, ETC.**
348 .Flame sweeps dished incandescing surface
349 **ADJUNCTIVE, RELATIVELY LOW VELOCITY, FLAME MAINTAINING FUEL PASSAGE**
350 **FLAME HOLDER HAVING PROTECTIVE FLAME ENCLOSING OR FLAME STABILIZING STRUCTURE**
351 .Including means feeding air axially spaced points of the flame
352 ..Axial perforations along combustion tube
353 .Tubular member delineates flame
354 **MIXER AND FLAME HOLDER**
355 .Bunsen burner type
356 **MISCELLANEOUS**

**FOREIGN ART COLLECTIONS**

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