

335	SUBMERGED WELL	245	.Specific pattern of plural wells
336	.Testing	246	.Using microorganisms
337	..For leak	247	.Nuclear energy or radioactivity for treating
338	.Connection or disconnection of submerged members remotely controlled	248	.Electric current or electrical wave energy through earth for treating
339	..With provision for removal or repositioning of member without removal of other well structure	249	.Vibrating the earth or material in or being placed in the earth pores
340	..Disconnection	250.01	.With indicating, testing, measuring or locating
341	..With orienting or aligning of member for connection	251.1	..Including in situ combustion
342	...Including removable, member mounted guide	252.1	..Including production of earth fluid by driving fluid
343	...Including means to pull member into position	252.2	...Residual oil or oil saturation
344	..Connection to provide fluid flow path	252.3	...Salinity or acidity
345	...Connection of riser-and-tubing assembly to other structure	252.4	...Flood front
346	...Yieldable tubing	252.5	...Permeability or viscosity
347	...Connection of lateral flow line	252.6	...And tracing material
348	..Connection of pipe hanging	253.1	..Indicating the location, presence, or absence of cement
349	..Connection of guide means	254.1	..Determining position of earth zone or marker
350	.Submerged, buoyant wellhead or riser	254.2	...Well logging
351	.Means removably connected to permanent well structure	255.1	..Determining position of object in well
352	..Surface vessel	255.2	...Tool orienting
353	..Having means to move vessel to precise location	255.3	...Using whipstock
354	...Having means to hold vessel at given location (e.g., anchor, etc.)	250.02	..Permeability determining
355	...With means to compensate for vessel movement	250.03	..Determining fluid interface or fluid level
356	..Means to provide protective environment for operative access below surface of water	250.04	..Plug indicating or releasing
357	..Separator	250.05	..Scale or corrosion determination
358	..Drilling means	250.06	..Steam quality
359	..Removable riser	250.07	..Bottom hole pressure
360	..Well component assembly means	250.08	..Leak testing or locating
361	..Pipe cutting means	250.09	..Impression means
363	.With safety or emergency shutoff	250.1	..Fracturing characteristic
364	.Including disaster feature	250.11	..Holder for coupon or sensor
365	.With provision for disassembly	250.12	..Tracer
366	.Multiple wells	250.13	..Determining stuck point
367	.Riser	250.14	..Of cementing or plugging technique
368	.Wellhead	250.15	..Automatic control for production
244.1	PROCESSES	250.16	..Prospecting
		250.17	..Including testing or treating tool having at least one actuatable packer
		256	.In situ combustion

257	..Injecting while producing by in situ combustion from same well	263	.Cyclic injection then production of a single well
258	..Plural distinct superimposed formations	276	.Providing porous mass of adhered filter material in well
259	..Including fracturing or attacking formation	277	.Repairing object in well
260	..Injecting specific fuel or catalyst for burning into formation	278	.Graveling or filter forming
261	..Injecting specific material other than oxygen into formation	279	.Material placed in pores of formation to treat resident fluid flowing into well
262	..Solid fuel or particles in well	280.1	.Specific propping feature (EPO)
264	.Sampling well fluid	280.2	..Composition of proppant (EPO)
265	..Separating material entering well	281	.Separate steps of (1) cementing, plugging or consolidating and (2) fracturing or attacking formation
266	..Injection and producing wells	282	.Specific low fluid loss feature for fluid attacking formation
267	..Separating outside of well	283	.Specific low fluid loss feature for fracturing fluid or cement causes fracture
268	.Distinct, separate injection and producing wells	284	.Fluid flow causes pellet to block opening in wall of conduit
270	..Injecting a composition to adjust the permeability (e.g., selective plugging)	285	.Cementing, plugging or consolidating
270.1	..Injecting a composition including a surfactant or cosurfactant	286	..Tamping, vibrating, exploding or using receptacle
270.2	...Nonaqueous type	287	..Removable molding or forming means
400	..Sequentially injected separate fluids (e.g., slugs)	288	..Including heating
401	...Injecting a gas or gas mixture	289	..Discharging cement from casing at different levels
402	....CO2 or carbonated gas	290	..By tubing which is subsequently lifted
403	.....In combination with additional organic material (e.g., alkyls, carbon chains)	291	..With piston separator
272.1	..Involving the step of heating	292	..Using specific materials
272.2	...In association with fracturing or crevice forming processes	293	...Cement or consolidating material contains inorganic water settable and organic ingredients
272.3	...Steam as drive fluid	294	...Cement or consolidating material is organic or has organic ingredient
272.4	....In combination with alkyls or carbon chains	295	....Organic material is resin or resinous
272.5	....With override zone, diverting, or path blocking operation	296	.Preventing flow into strainer while lowering by blocking openings
272.6	...Liquid material injected	297	.Perforating, weakening, bending or separating pipe at an unprepared point
272.7	..Horizontal well	298	..Perforating, weakening or separating by mechanical means or abrasive fluid
271	..Including fracturing or attacking formation		
269	..Fluid injected from longitudinally spaced locations in injection well		
275	..Injected fluid comprises water and material other than inorganic gas		

299	.With explosion or breaking container to implode	382	..Providing support for well part (e.g., hanger or anchor)
300	.Chemical inter-reaction of two or more introduced materials (e.g., selective plugging or surfactant)	383	..By fluid driven piston
		384	..With bending of tubing
		385	..Flexible cable or wire
301	.Freeing stuck object, grappling or fishing in well	386	..Fluid flow control member (e.g., plug or valve)
		387	..With sealing feature (e.g., packer)
302	.Heating, cooling or insulating	50	WELLS WITH LATERAL CONDUITS
303	..Placing preheated fluid into formation	51	MEANS FOR FORMING FILTER BEDS (E.G., GRAVEL PLACING)
304	.Dissolving or preventing formation of solid oil deposit	52	PLURAL WELLS
305.1	.Placing fluid into the formation	53	AUTOMATIC
306	..Fluid enters and leaves well at spaced zones	54	.Float controlled valve
		54.1	WITH MEANS FOR SEPARATELY PUMPING FROM PLURAL SOURCES IN WELL
307	..Attacking formation		MEANS FOR CUTTING CABLE OR ROPE BELOW GROUND
308.1	..Fracturing (EPO)	54.5	
308.2	...Using a chemical (EPO)		
308.3	...Water based composition with inorganic material (EPO)	54.6	.Cutting means actuated by contacting element suspended in well by cable or rope
308.4	...Oil based composition (EPO)		
308.5	...Including cross-linking agent (EPO)	55	MEANS FOR PERFORATING, WEAKENING, BENDING OR SEPARATING PIPE AT AN UNPREPARED POINT
308.6	...Foam (EPO)		
309	.Producing foam or gas in well by foaming or gas producing material	55.1	.With disparate below ground feature
		55.2	.Perforating or splitting cutter
310	.Entraining or incorporating treating material in flowing earth fluid	55.3	..Wedge or cam actuated
		55.6	.Cutter rotates circumferentially of pipe
			..Internal
311	.Cleaning or unloading well	55.7	...Tool moved radially by fluid pressure
312	..Liquid introduced from well top	55.8	
313	.Parallel string or multiple completion well	56	SCREEN AND OUTSIDE CLEANING PIPE WITH HEATING, REFRIGERATING OR HEAT INSULATING MEANS
369	.Producing the well	57	
370	..Including varying downhole pressure	58	.Fuel supply or hot billet in well
371	..Including non-expulsive material placed in well	59	.Burner in well
372	..By fluid lift	60	.Electrical heater in well
373	.Operating valve, closure, or changeable restrictor in a well	61	.Heater surrounding production tube
		62	.With eduction pump or plunger in well
374	..Operated by fluid pressure controlled above ground	63	WITH EXPLOSIVE OR GAS GENERATING MEANS IN WELL
375	...By auxilliary fluid control line	64	WITH TIME OR DISTANCE MEASURING, TEMPERATURE RESPONSIVE OR COUNTING MEANS
376	.Destroying or dissolving well part		
377	.Disassembling well part	65.1	WITH ELECTRICAL MEANS
378	.Assembling well part	66	.Indicating
379	..Above ground parts	66.4	.Electrical motor (e.g., solenoid actuator)
380	..Conduit		
381	.Placing or shifting well part	66.5	.Magnetic

66.6	.Valve	88.4	..With hydraulic conduit or line extending through outer member
66.7	..Longitudinally movable operator	78.1	.With tube rotating means (rotary tables)
67	WITH BELOW AND ABOVE GROUND MODIFICATION	79.1	.Cap having transporting means or ground support
68	.Eduction pump or plunger in well	80.1	.Having retractable pipe section to allow closing of gate type valve or flapper valve for rod or pipe
68.5	..With above ground (1) motor carried by casing or casing support or (2) well fluid pump	81.1	.Fluid catcher around pipe coupling
69	.With receptacle for insertion into well	82.1	.Releasable seal or cleaner disengaged by projection on inner member
70	.Head for tool, piston or cleaner (e.g., cement head)	83.1	..Latches releasable radially inward
71	.With above ground casing sinking means	84.1	.With seal for reciprocating member
72	.Above ground actuating means for below ground device	84.2	..Cooling fluid or grease supplied to seals
73	..Tubing or casing actuated	84.3	..Rotary blowout preventer type
74	.With below ground screen	84.4	..Fluid pressure actuated seals
75.11	ABOVE GROUND APPARATUS	84.5	..Seal fixedly mounted to rod
76.1	.Having structure for converting from one mode of operation to another; e.g., valve to packer	90.1	.With means for inserting fluid into well
77.1	.Moving tubing or cable into an existing well	75.15	.With means for injecting solid or particulate material into the well
77.2	..Coiled tubing	91.1	.With flow restrictions (e.g., chokes or beans)
77.3	..Chain injector	92.1	.Cap or head pivotably attached to tube or casing
77.4	..Piston and cylinder	93.1	.Split cap or head
77.51	.With means facilitating connecting or disconnecting supported tubing or rod sections	94.1	.Laterally adjustable cap or head
77.52	..With elevator detail	95.1	.Central valve or closure and lateral port
77.53	..Upper and lower slips	96.1	.External anchoring or bracing means
85.1	.With assembly or disassembly means (e.g., handling, guiding, or tool feature)	97.1	.With valve on cap or head
85.2	..Pitless well adapters	75.13	.Well caps or casing heads
85.3	..Seal or bushing insertion or removal	75.14	.Suspension means
85.4	..With blowout preventer	75.12	.Treatment of produced fluids
85.5	..Guiding or aligning feature	97.5	.Parallel pipes extending along distinct paths through wellhead
86.1	.Inner member anchor or seal with valve	98	GRAPPLE AND WELL ANCHORED LIFTING MEANS
86.2	..Annular sealing type valve	99	WITH JUNK RETRIEVING MEANS
86.3	..Gate type (perpendicular to pipe) valve	100	LATERAL PROBE OR PORT SEALED AGAINST WELL WALL
87.1	..Axially movable type valve	101	PACKER OR PLUG AND PUMP OR PLUNGER MEANS EXERTING OUTWARD PRESSURE
88.1	.Inner member anchor or seal with lateral port	102	CONVERTIBLE
89.1	..Plural inner pipes		
89.2	..Parallel pipes (as opposed to concentric)		
89.3	..Having slip type hanger		
88.2	..Slip type well anchor		
88.3	..Seal actuated with anchor		

104	WITH MOTOR FOR ROTARY OR OSCILLATING MOTION	124	...Screw threaded
105	WITH EDUCTION PUMP OR PLUNGER	125	...Radially movable latch
105.1	.Having sediment trap or deflector	126	..With controllable passage between central chamber and space below packer
105.2	..Carried by reciprocating plunger or plunger rod	127	...Spaced packer or plug seals
105.3	..Sediment trap formed in pumping chamber	128	...Passage controllable by movement of central chamber
105.4	..In pump discharge flow path	129	..With controllable bypass outside central conduit
105.5	.Having liquid-gas separator	130	...Packer expanded by upper valve
105.6	..Gas fed to entrainment type pump	131	..With controllable passage between central conduit and space above packer or plug
106	.With packer or plug		
107	.Receptacles	132	..Portion extends beyond end of surrounding conduit
108	..Piston actuates foot valve		
109	..Telescoping	133	..With controllable passage through packer
110	..Lateral port always below piston and used in well	134	..Support and holddown expanding anchors
111	..Bail engaging piston rod		
112	.With leak means	135	..Flow stopping type, e.g., plug
113	COMBINED (E.G., WITH NON- ELECTRICAL INDICATING)	136	..Spring set anchor
114	CENTRAL MEMBER WITH PRE-SET PACKER OR PLUG IN SAME CONDUIT	137	...Spring moves anchor slip relative to wedge or cam
115	CENTRAL CHAMBER SEALED WITH RESPECT TO PREPOSITIONED MODIFIED SURROUNDING CONDUIT	138	..Wedge or cam and friction drag
116	.Surrounding conduit carries packer or plug	139	...Threaded element rotated
117	RECEPTACLE OR PART THEREOF LEFT IN WELL	140	...Anchor above packer or plug seal
117.5	MEANS FOR GUIDING INSERTABLE ELEMENT Laterally OF WELL AXIS (E.G., WHIPSTOCK)	141	.Sealing portion closes port between central pipe and outside space when unexpanded
117.6	.Secured in operative position by movable means engaging well conduit (e.g., anchor)	142	.With controllable passage between central chamber and space below packer
117.7	MEANS ANCHORED AGAINST ROTATION IN ONE CONDUIT SECTION FOR RELATIVELY ROTATING ANOTHER SECTION	143	..Central conduit detachable
179	PACKERS OR PLUGS	144	...Bottom supported casing or screen section
118	.With expanding anchor	145	..Bypass closing and passage opening to upward flow constrained to occur simultaneously
119	..Relatively movable packers or plugs	146	..Passage connects with space below packers and continuously open passageway connects with space between packers
120	..Anchor actuated by fluid pressure	147	..Passage connects with space between packer or plug seals
121	...Pressure transmitted by cup type packer or plug seal	148	..Upwardly biased check valve and means for opening or bypassing it
122	...Pressure transmitted by packer or plug expanded by confined fluid from central chamber, pump, or plunger	149	..With passageway between central chamber and space above packer
123	..With detachable setting means	150	...Passageway controllable by movement of central chamber

151	...Passageway valve directly responsive to fluid pressure	170	BRUSHING, SCRAPING, CUTTING OR PUNCHING-TYPE CLEANERS
152	..Passage controllable by movement of central chamber	171	.Perforation cleaners
180	.Adjustable over pipe or set over prepositioned pipe	172	.Bow spring type
181	.With detachable setting means	173	.On tubing or casing
182	..Packer or plug locked expanded	174	.Retractable on support while lowering
183	.With controllable bypass outside central conduit	175	.Reciprocable relative to central member extending from well top
184	.With controllable passage between central conduit and space above packer or plug	176	.On sucker rod
185	.With central conduit and fluid port to space outside	177.1	SONIC DEVICE
186	..Port between sealing portions and bypass around	177.2	.With specific downhole feature
187	.Expanded by confined fluid from central chamber, pump or plunger	177.3	WIPER
188	.Controllable passage through packer	177.4	CEMENTING DEVICE
189	.For non-concentric members	177.5	HYDRAULIC FRACTURING DEVICE
191	.Spaced sealing portions	177.6	VIBRATOR
192	.Flow stopping type; e.g., plug	177.7	AGITATOR
193	..Free falling type (e.g., dropped ball)	178	WITH JAR MEANS FOR RELEASING STUCK PART
194	...With sleeve valve	205	SCREEN WITH VALVE, CLOSURE, CHANGEABLE RESTRICTOR OR PORTION REMOVABLE IN WELL
195	.Deformable portion engages conduit restriction	206	EXPANSIBLE ANCHOR OR CASING
196	.Central support has shoulders expanding sealing portion, or telescopes	207	.Expansible casing
202	.Cup type	208	.Liner hanger
203	.Non-deformable type	209	.Set by wedge or cam at any point by drop only (e.g., tubing catcher)
153	PISTONS, FLUID DRIVEN INTO WELL (E.G., CEMENTING PLUGS)	210	..With friction drag for setting by turning movement also
154	.Surrounding conduit valve or closure opened by piston	211	..With spring
155	.With downflow past piston	212	.Fluid pressure actuated
156	.With stop	213	.Bowed anchor means
157	SCREEN WITH WASHING POINT OR SHOE	214	.Spring set
158	.Detachable wash pipe	215	..Spring moves anchor slip relative to wedge or cam
162	RECEPTACLES	216	.With wedge or cam and friction drag
163	.With separate air chamber having openable passage	217	.Expansible means translated by wedge or cam
164	.With destroyable closure and valve	222	WHIRLING OR LATERAL DISCHARGE OR PROJECTABLE NOZZLES
165	.With valved or closed top	223	.Rotary or projectable
166	.Valve control means contacting well conduit wall	316	VALVES, CLOSURES OR CHANGEABLE RESTRICTORS
167	.Bottom receiving and side discharge valves	317	.Destructible element
168	.Readily releasable bottom valve	318	.Operated by dropped element
169	.Lateral ports used in well	319	.Fluid operated
		320	..Variably opened
		321	..Fluid pressure biased to open position position
		322	...Retrievable
		323	...Locked open or closed

324 ...With fluid pressure equalizing means

325 ..One way, e.g., check valve type

326 ...Flexible valve element

327 ...Shoes with check valve

328Loose ball closure

329 ..Loose ball closure with limited reverse flow

330 ..Rotated operator

331 ..Lug in branched slot, e.g., "J" slot

332.1 ..Longitudinally movable operator

332.2 ..Having rotational movement

332.3 ...Ball valve type

332.4 ..Operated by means inserted from the surface

332.5 ..Valving means inserted or retrieved to operate

332.6 ..Having a dump or discharge type means

332.7 ..Having equalizing valve

332.8 ..Flapper type

333.1 ..Contact with bore bottom

334.1 ..Vertical movement of conduit

334.2 ...And rotational movement; e.g., ball valve-type

334.3 ...Drain-type

334.4 ...Fluid flow through lateral port to exterior

227 **SCREENS**

228 ..Porous material

229 ..Inserted screen plug

230 ..Woven mesh

231 ..Spiral

232 ..With spacing lug for adjacent turns

233 ..With perforated pipe

234 ..Strip or rod

235 ..Stacked annular sections

236 ..Concentric pipes

237 **DETENTS OR CLUTCHES**

238 ..Flow permitting means bridging fluid conduit

239 ..Operated by dropped weight

240 ..Lug in closed branched slot

241.1 **GUIDE FOR DEVICE OR CONDUIT**

241.2 ..On sucker or pump rod

241.3 ..Rotatable or having a rotatable element

241.4 ..Surrounding existing rod

241.5 ..For a wireline operation

241.6 ..Surrounding existing device or tubing

241.7 ..Removably secured by a fastener (e.g., pin) parallel to tubing

242.1 **CONDUIT WALL OR SPECIFIC CONDUIT END STRUCTURE**

242.2 ..Flexible tube or cable

242.3 ..Plural, parallel, nonconcentric conduits

242.4 ..Corrosion prevention or deterring

242.5 ..Side entry

242.6 ..Downhole coupling or connector

242.7 ..Telescopic

242.8 ..Shoe detail

242.9 ..Brick or cement casing liner

243 **MISCELLANEOUS (E.G., ANCHOR PIPES)**

CROSS-REFERENCE ART COLLECTIONS

901 **WELLS IN FROZEN TERRAIN**

902 **FOR INHIBITING CORROSION OR COATING**

FOREIGN ART COLLECTIONS

FOR 000 **CLASS-RELATED FOREIGN DOCUMENTS**

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

PROCESSES (166/244.1)

FOR 100 ..Specific propping feature for a fracture (166/280)

FOR 101 ..Fracturing (166/308)

