

E21B

EARTH OR ROCK DRILLING; OBTAINING OIL, GAS, WATER, SOLUBLE OR MELTABLE MATERIALS OR A SLURRY OF MINERALS FROM WELLS

Definition statement

This place covers:

Earth drilling, e.g. deep drilling; obtaining oil, gas, water, soluble or meltable materials or a slurry of minerals from wells. This subclass also includes drilling at shallow depths but over extended distances, such as drilling for laying a pipeline under surface obstacles.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Mining or quarrying	E21C
Making shafts, driving galleries or tunnels	E21D

E21B 1/00

Percussion drilling

Definition statement

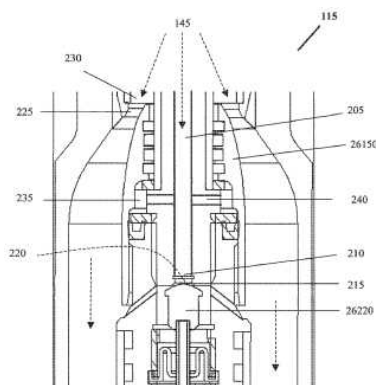
This place covers:

Machines and methods in which the drilling action is done principally by percussion.

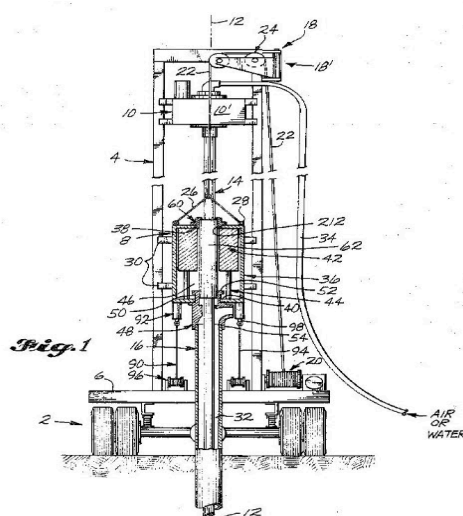
The percussive drive is placed outside of the borehole, and the drilling can be for any depth, including drillholes and mining applications.

Illustrative examples of the subject matter classified in this place:

1.



2.



Relationships with other classification places

When classifying in groups [E21B 1/12](#) - [E21B 1/38](#), a symbol from one of the following main groups of [B25D](#) should also be given:

[B25D 9/00](#) Portable percussive tools with fluid-pressure drives.

[B25D 11/00](#) Portable percussive tools with motor drive.

[B25D 16/00](#) Portable percussive machines with superimposed rotation.

[B25D 17/00](#) Details of, or accessories for, portable power-driven percussive tools.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Drives used in the borehole	E21B 4/00
Drives for combined percussion and rotary drilling	E21B 6/00
Portable drilling rigs	E21B 7/20
Derricks, masts	E21B 15/00
Rotary drilling machines in general	B23B

E21B 3/00

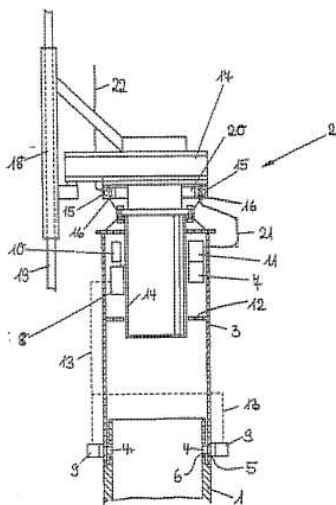
Rotary drilling

Definition statement

This place covers:

Machines and methods in which the drilling action is done principally by rotation.

Illustrative example of the subject matter classified in this place:



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Drives for drilling, used in the borehole	E21B 4/00
Drives for combined percussion and rotary drilling	E21B 6/00
Portable drilling rigs	E21B 7/20
Derricks, masts	E21B 15/00
Rotary drilling machines in general	B23B

E21B 3/04

Rotary tables

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Portable drilling rigs with rotary tables	E21B 7/021
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E21B 3/045

{movably mounted on the drilling structure or platform (derricks adapted to be moved on their substructure [E21B 15/003](#))}

References

Limiting references

This place does not cover:

Derricks adapted to be moved on their substructure	E21B 15/003
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Supports for the drilling machine specially adapted for underwater drilling	E21B 15/02
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E21B 3/06

Adaptation of rotary draw works to drive rotary tables

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Connecting or disconnecting couplings or joints	E21B 19/16
Rope, cable or chain winding mechanisms; Capstans	B66D 1/00

E21B 4/00

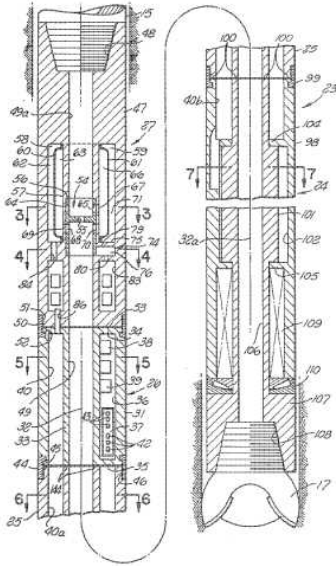
Drives for drilling, used in the borehole

Definition statement

This place covers:

Drives located inside the borehole for powering drilling units.

Illustrative example of subject matter classified in this place:



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Rotary-piston machines or pumps	F04C 2/00
Rotary-piston machines with helical teeth, e.g. Moineau motors	F04C 2/107
Arrangements for handling mechanical energy structurally associated with the machine, e.g. structural association with mechanical driving motor or auxiliary dynamo-electric machine	H02K 7/00

E21B 4/003

{Bearing, sealing, lubricating details (for roller bits [E21B 10/22](#))}

References

Limiting references

This place does not cover:

Bearing, lubrication or sealing details for roller bits	E21B 10/22
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Bearings in general	F16C
Sealing in general	F16J
Lubricating in general	F16N

E21B 4/006

{Mechanical motion converting means, e.g. reduction gearings ([E21B 4/10](#) takes precedence)}

References**Limiting references**

This place does not cover:

Continuous unidirectional rotary motion of shaft or drilling pipe effecting consecutive impacts	E21B 4/10
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Gearings in general	F16H
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E21B 4/02

Fluid rotary type drives

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Hydraulic turbines for drilling wells	F03B 13/02
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E21B 4/06

Down-hole impacting means, e.g. hammers (boring rams [E21B 11/02](#))

References**Limiting references**

This place does not cover:

Boring rams	E21B 11/02
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Percussion drill bits	E21B 10/36
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Releasing-jars	E21B 31/107
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E21B 6/00

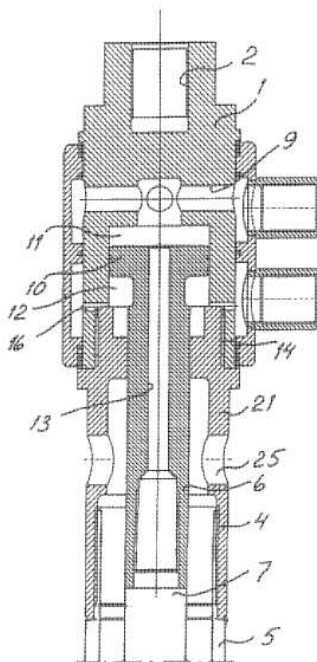
Drives for drilling with combined rotary and percussive action

Definition statement

This place covers:

Drives outside the borehole for combined percussion and rotary drilling.

Illustrative example of the subject matter classified in this place:



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Drives for drilling, used in the borehole	E21B 4/00
Portable drilling rigs	E21B 7/20
Derricks, masts	E21B 15/00
Methods or apparatus for generating mechanical vibrations of infrasonic, sonic or ultrasonic frequency	B06B 1/00
Portable percussive machines with superimposed rotation	B25D 16/00

E21B 7/00

Special methods or apparatus for drilling

Definition statement

This place covers:

Drilling methods and apparatus characterised by any aspect that differs from those of conventional drilling, which is understood as drilling a vertical borehole with a roller or drag type bit, using a derrick or mast.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Rotary or percussion drill bits	E21B 10/00
Supports for the drilling machine, e.g. derricks or masts	E21B 15/00
Drilling rods or pipes	E21B 17/00
Obtaining cores	E21B 25/00
Setting of casings when not simultaneous with drilling of the borehole	E21B 43/10
Details of, or accessories for, portable power-driven percussive tools	B25D 17/00
Vehicles adapted to transport or to comprise special loads	B60P 3/00
Underwater drilling for submerged foundations	E02D 27/52
Erecting posts for fences	E04H 17/263
Machines for drilling and setting anchoring bolts	E21D 20/003
Details of hydraulic circuits	F15B

E21B 7/002

{Drilling with diversely driven shafts extending into the borehole ([E21B 7/001](#) takes precedence)}

Definition statement

This place covers:

Drilling devices with multiple shafts in the borehole that are independently driven or one shaft is driven relative to another.

References

Limiting references

This place does not cover:

Drilling a non-circular hole	E21B 7/001
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Plural down-hole drives	E21B 4/16
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Simultaneously drilling and casing	E21B 7/20
Pipes with plural fluid passages	E21B 17/18

E21B 7/003

{Drilling with mechanical conveying means}

Definition statement

This place covers:

Drilling devices with mechanical means for removing drill cuttings and soil from the borehole.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Boring grabs	E21B 11/04
Containers for collecting material in boreholes	E21B 27/00
Tunneling	E21D

E21B 7/006

{combined with a bucket-type container}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Bailers with helical conveying means	E21B 27/04
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E21B 7/007

{Drilling by use of explosives (underwater drilling using explosives
[E21B 7/1245](#))}

References

Limiting references

This place does not cover:

Underwater drilling using explosives	E21B 7/1245
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Setting-tools actuated by explosives	E21B 23/04 , E21B 23/065
Cutting or destroying objects in boreholes by explosives	E21B 29/02
Freeing objects using explosives	E21B 31/1075

Gun or shaped-charge perforators	E21B 43/116
Fracturing by explosives	E21B 43/263 , E21B 43/248
Taking samples using explosives	E21B 49/04

E21B 7/008

{Drilling ice or a formation covered by ice}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Ice-fishing	A01K 97/01
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E21B 7/02

Drilling rigs characterised by means for land transport {with their own drive},
e.g. skid mounting or wheel mounting

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Portable drilling rigs for use on underwater floors	E21B 7/124
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E21B 7/021

{With a rotary table, i.e. a fixed rotary drive for a relatively advancing tool}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Rotary tables	E21B 3/04
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E21B 7/024

{having means for adapting to inclined terrain; having means for stabilizing the
vehicle while drilling}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Levelling of soil-shifting machines	E02F 9/028
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E21B 7/025

{Rock drills, i.e. jumbo drills}

Definition statement

This place covers:

Drilling holes into rock material or soil in mines, quarries and construction sites, e.g. blast holes or anchor bolt holes, using drilling machines with drill motor carriage displaceable on feed beam.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Machines for drilling anchor holes and setting anchor bolts	E21D 20/003
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E21B 7/028

{the drilling apparatus being detachable from the vehicle, e.g. hand portable drills}

Definition statement

This place covers:

Drilling tools portable, e.g. by hand, and detachable from portable drilling rig vehicles, e.g. from motorcars.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Hand operated drilling tools	E21B 11/005
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E21B 7/04

Directional drilling

Definition statement

This place covers:

Directional drilling in the general sense of producing a borehole in a direction other than vertical. The drilling direction can be essentially horizontal, such as for laying a pipe under an obstruction or in an urban environment.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Derricks or masts specially adapted therefor	E21B 15/04
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E21B 7/06**Deflecting the direction of boreholes****References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Directional window cutting	E21B 29/06
Deflecting the direction of fishing tools	E21B 31/14

E21B 7/12**Underwater drilling (using heave compensators [E21B 19/09](#))****References****Limiting references**

This place does not cover:

Underwater drilling using heave compensators	E21B 19/09
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Supports for the drilling machine, e.g. derricks or masts, specially adapted for underwater drilling	E21B 15/02
Telescoping joints	E21B 17/07
Well heads specially adapted for underwater installations	E21B 33/035
Submerged foundations	E02D 27/52

E21B 7/128**from floating support with independent underwater anchored guide base****References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Guide line systems	E21B 41/10
Floating drilling platforms	B63B 35/44

E21B 7/14

Drilling by use of heat, e.g. flame drilling

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Drilling by use of explosives	E21B 7/007
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E21B 7/15

of electrically generated heat

Definition statement

This place covers:

Drilling using, for example, lasers or electrical discharge between electrodes that generate shock waves.

E21B 7/18

Drilling by liquid or gas jets, with or without entrained pellets ([E21B 7/14](#) takes precedence)

References

Limiting references

This place does not cover:

Drilling by use of heat, e.g. flame drilling	E21B 7/14
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Obtaining a slurry of minerals from wells	E21B 43/29
Hydraulic monitors	E21C 45/00

E21B 7/20

Driving or forcing casings or pipes into boreholes, e.g. sinking; Simultaneously drilling and casing boreholes

Definition statement

This place covers:

Methods in which the drilling action takes place simultaneously with the installation of a casing or of the pipe to be installed, with the borehole being horizontal or not.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Surface means for applying to-and-fro rotation movements to the casing	E21B 3/025
Drilling with multiple driven shafts	E21B 7/002
Pushing means outside of the borehole	E21B 19/08
Placing piles	E02D 7/00
Sinking shafts while moving the lining downwards	E21D 1/08
Making galleries by forcing prefabricated elements through the ground	E21D 9/005

E21B 7/201

{with helical conveying means}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Drilling with helical conveying means	E21B 7/005
Augers	E21B 10/44
Drilling rods or pipes with helical structure	E21B 17/22

E21B 7/203

{using down-hole drives}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Down-hole drives per se	E21B 4/00
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E21B 7/206

{using down-hole drives}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Down-hole drives per se	E21B 4/00
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E21B 7/208

{using down-hole drives ([E21B 7/203](#) and [E21B 7/206](#) take precedence)}

References**Limiting references**

This place does not cover:

Using down-hole drives in combination with helical conveying means	E21B 7/203
Using down-hole drives without earth removal	E21B 7/206

Informative references

Attention is drawn to the following places, which may be of interest for search:

Using down-hole drives per se	E21B 4/00
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E21B 7/26

Drilling without earth removal, e.g. with self-propelled burrowing devices
([E21B 7/30](#) takes precedence)

Definition statement

This place covers:

Drilling or forming holes without cutting into the soil or earth.

Drilling or forming holes by driving a tool into the earth to displace and compact the soil.

References**Limiting references**

This place does not cover:

Enlarging drilled holes, e.g. by counterboring, without earth removal	E21B 7/30
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Down-hole drives	E21B 4/00
Fluid operated of the self propelled-type	E21B 4/145

E21B 7/265

{Combined with earth removal}

Definition statement

This place covers:

The use of earth removal devices or processes separate from the drilling devices to remove earth or soil from the hole.

E21B 7/28

Enlarging drilled holes, e.g. by counterboring

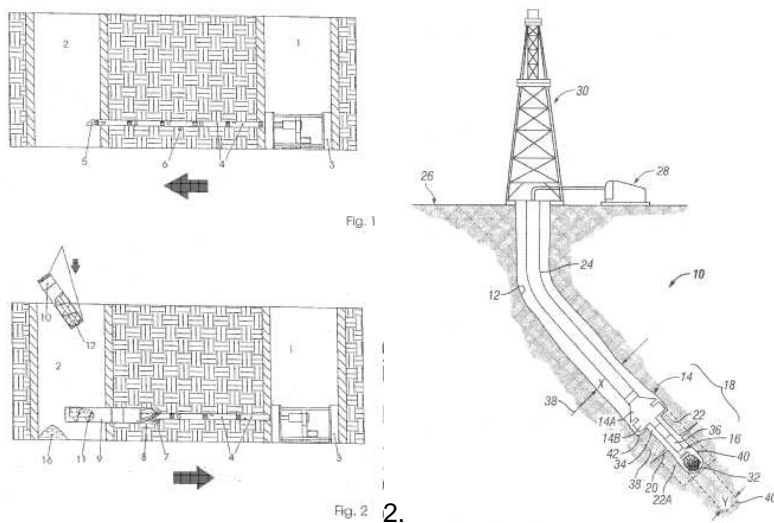
Definition statement

This place covers:

Vertical or horizontal drilling, in which means are provided for enlarging a borehole made previously, which borehole may have been made by the same machine carrying out the enlargement, or by a different machine or in a previous operation.

Illustrative examples of the subject matter classified in this place:

1.



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Drill bits for enlarging the borehole	E21B 10/26
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E21B 10/00

Drill bits (specially adapted for deflecting the direction of boring {[E21B 7/064](#)}; with means for collecting substances [E21B 27/00](#))

Definition statement

This place covers:

Drill bits for any application in earth drilling, be it deep drilling for oil and gas or rock drilling for mining or for use in an underground space.

References

Limiting references

This place does not cover:

Drill bits specially adapted for deflecting the direction of boring	E21B 7/064
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Drill bits with means for collecting substances	E21B 27/00
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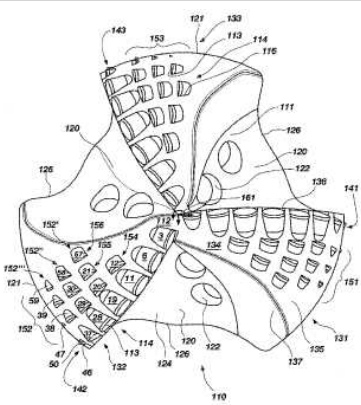
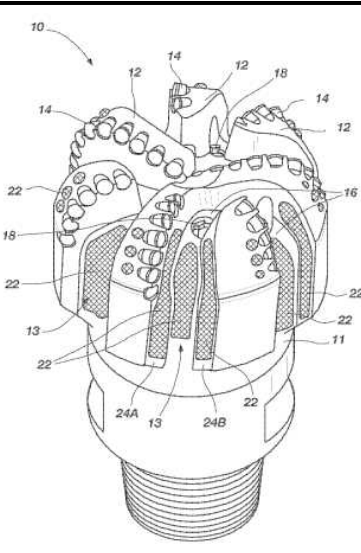
Informative references

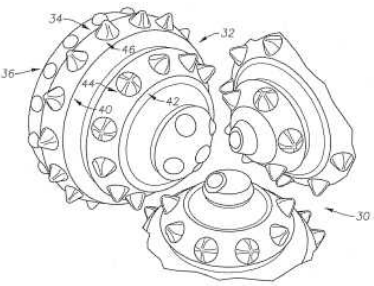
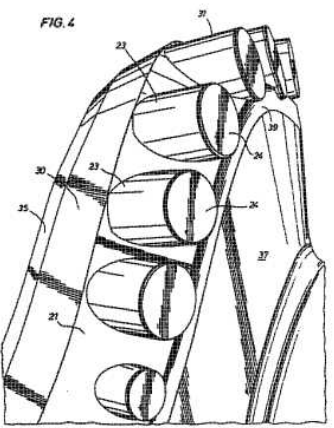
Attention is drawn to the following places, which may be of interest for search:

Manufacture of articles from metal powder	B22F
Special treatment of metallic powder, e.g. to facilitate working, to improve properties	B22F 1/00
Cutting tools of which the bits or tips are of special material	B23B 27/14
Drill bits for stone or stone-like material	B28D 1/00
Alloys containing diamond	C22C
Bulkheads, piles specially adapted to foundation engineering	E02D 5/00

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

<p>Arrangement of teeth or other cutting elements: placement or number of elements on a bit body</p>	
<p>Wear resisting parts: materials on the body of the bit adapted for withstanding wear caused by the flow of drilling fluid having cuttings entrained therein</p>	

Chisel or button type inserts:	
Preformed cutting elements mounted on a distinct support:	

E21B 10/02

Core bits (characterised by wear resisting parts [E21B 10/48](#))

References

Limiting references

This place does not cover:

Core bits characterised by wear resisting parts	E21B 10/48
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Obtaining undisturbed cores	E21B 25/00
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E21B 10/10

with roller axle supported at both ends

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Roller bits with disc cutters	E21B 10/12
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E21B 10/18

characterised by conduits or nozzles for drilling fluids

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Drilling fluid supply to the bearings	E21B 10/23
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E21B 10/20

characterised by detachable or adjustable parts, e.g. legs or axles

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Cross axle roller bits	E21B 10/10
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E21B 10/22

characterised by bearing, lubrication or sealing details

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Bearings in general	F16C
Lubricating in general	F16N

E21B 10/26

Drill bits with leading portion, i.e. drill bits with a pilot cutter; Drill bits for enlarging the borehole, e.g. reamers (percussion drill bits with leading portion [E21B 10/40](#))

References**Limiting references**

This place does not cover:

Percussion drill bits with leading portion	E21B 10/40
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Enlarging boreholes in general	E21B 7/28
Augers with leading portion	E21B 10/44

Turning or boring with stone, rock or concrete as tool or workpiece material	B23B 2226/75
Tools for working stone or stone-like materials by boring or drilling	B28D 1/146

E21B 10/44

Bits with helical conveying portion, e.g. screw type bits; Augers with leading portion or with detachable parts ([E21B 10/42](#) takes precedence)

References

Limiting references

This place does not cover:

Rotary drag type drill bits with teeth, blades or like cutting elements, e.g. fork-type bits or fish tail bits	E21B 10/42
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Drilling rods with helical structure	E21B 17/22
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E21B 10/445

{percussion type, e.g. for masonry}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Percussion drill bits in general	E21B 10/36
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E21B 10/46

characterised by wear resisting parts, e.g. diamond inserts

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Drill bits with self-renewable cutting edge	E21B 10/006
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E21B 10/48**the bit being of core type****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Saw cylinders having their cutting rim equipped with abrasive particles for drilling stone or glass	B28D 1/041
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E21B 10/55**with preformed cutting elements****Definition statement***This place covers:*

Rotary drag type bits with blades having preformed cutting elements mounted on a distinct support, e.g. polycrystalline inserts.

References**Informative references***Attention is drawn to the following places, which may be of interest for search:*

Inserts per se	E21B 10/56 , E21B 10/58
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E21B 10/567**with preformed cutting elements mounted on a distinct support, e.g. polycrystalline inserts****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Manufacture of articles from metallic powder	B22F
Metal-working not otherwise provided for	B23P
Alloys containing diamonds	C22C

E21B 10/5671**{with chip breaking arrangements}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Cutting tools of which the bits or tips are of special material and characterised by chip-breakers	B23B 27/143
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E21B 10/58

Chisel-type inserts ([E21B 10/485](#), [E21B 10/52](#) take precedence)

References

Limiting references

This place does not cover:

Drill bits characterised by wear resisting parts, the bit being of core type with inserts in form of chisels, blades or the like	E21B 10/485
Drill bits characterised by wear resisting parts, the bit being of roller type with chisel- or button-type inserts	E21B 10/52

Informative references

Attention is drawn to the following places, which may be of interest for search:

Drill bits characterised by wear resisting parts, the bit being of the rotary drag type, e.g. fork-type bits	E21B 10/54
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E21B 10/60

characterised by conduits or nozzles for drilling fluids (for roller bits [E21B 10/18](#); for percussion drill bits [E21B 10/38](#))

References

Limiting references

This place does not cover:

Roller drill bits characterised by conduits or nozzles for drilling fluids	E21B 10/18
Percussion drill bits characterised by conduits or nozzles for drilling fluids	E21B 10/38

Informative references

Attention is drawn to the following places, which may be of interest for search:

Mining picks with arrangement of fluid-spraying nozzles	E21C 35/187
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E21B 10/62

characterised by parts, e.g. cutting elements, which are detachable or adjustable ([E21B 10/64](#) takes precedence; for roller bits [E21B 10/20](#); for augers [E21B 10/44](#))

References

Limiting references

This place does not cover:

Roller bits characterised by detachable or adjustable parts	E21B 10/20
Augers with leading portion or with detachable parts	E21B 10/44

Drill bits characterised by the whole or part thereof being insertable into or removable from the borehole without withdrawing the drilling pipe	E21B 10/64
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Rotary drag type drill bits	E21B 10/42
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E21B 10/64

characterised by the whole or part thereof being insertable into or removable from the borehole without withdrawing the drilling pipe

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Retrievable core receivers	E21B 25/02
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E21B 11/00

Other drilling tools

Definition statement

This place covers:

Other drilling tools different from the drill bits of [E21B 10/00](#)

E21B 11/005

{Hand operated drilling tools}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Hand portable tools detachable from portable drilling rigs	E21B 7/028
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E21B 11/02

Boring rams

Definition statement

This place covers:

Impact driven tools or devices for forming holes in ground or soil.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Percussion drives used in the borehole	E21B 4/06
Self-propelled fluid-operated hammers	E21B 4/145
Burrowing devices	E21B 7/26
Percussion drill bits	E21B 10/36

E21B 11/04

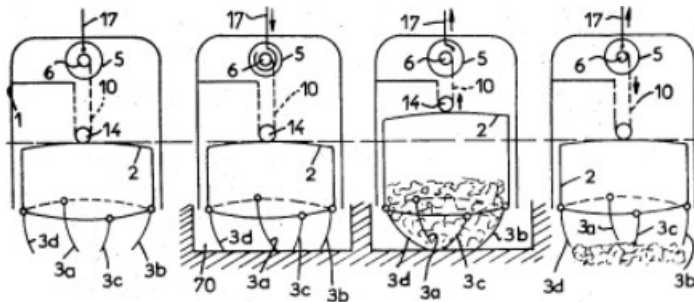
Boring grabs

Definition statement

This place covers:

Boring devices that both form the borehole and collect material for removal from the borehole.

Illustrative example of subject matter classified in this place:



E21B 11/06

with driven cutting chains or similarly driven tools

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Machines slitting solely by one or more cutter chains moving unidirectionally along jibs	E21C 25/22
Slitting by unguided cutter cables or cutter chains, or by unguided tools drawn along the working face by cables or the like	E21C 25/54
Slitting by cutter cables or cutter chains or by tools drawn along the working face by cables or the like, in each case guided parallel to the face, e.g. by a conveyor, by a guide parallel to a conveyor	E21C 25/56
Machines which completely free the mineral from the seam solely by slitting by a single chain guided on a frame with or without auxiliary slitting means	E21C 27/04

E21B 12/00

Accessories for drilling tools

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Connecting and disconnecting drill bit and drilling pipe	E21B 19/18
Sharpening stone drill bits	B24B 3/33

E21B 12/02

Wear indicators

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Investigating resistance to wear or abrasion	G01N 3/56
Investigating machinability by cutting tools; Investigating the cutting ability of tools	G01N 3/58

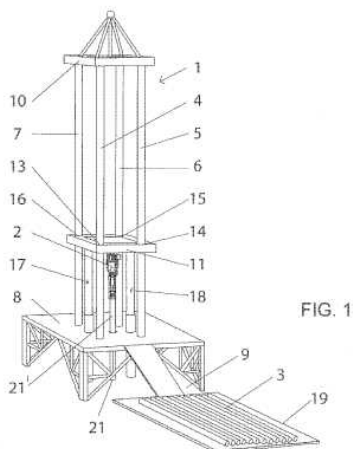
E21B 15/00

Supports for the drilling machine, e.g. derricks or masts

Definition statement

This place covers:

Drilling derricks or masts having such dimensions that require considerable complication for assembling and disassembling them, so that they cannot be considered as "movable" or "portable" units:



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Drill rigs with movable understructures	E21B 7/02
Floating drilling platforms	B63B 35/44
Drilling platforms on legs	E02B 17/00

E21B 15/003

{adapted to be moved on their substructure, e.g. with skidding means; adapted to drill a plurality of wells}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Derricks or masts specially adapted for directional drilling, e.g. slant hole rigs	E21B 15/04
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E21B 15/02

specially adapted for underwater drilling ([E21B 15/04](#) takes precedence)

References

Limiting references

This place does not cover:

Supports for the drilling machine specially adapted for directional drilling, e.g. slant hole rigs	E21B 15/04
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Derricks or masts adapted to be moved on their substructure, e.g. with skidding means	E21B 15/003
Floating drilling platforms	B63B 35/44
Drilling platforms on legs	E02B 17/00

E21B 15/04

specially adapted for directional drilling, e.g. slant hole rigs

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Derricks or masts adapted to be moved on their substructure, e.g. with skidding means	E21B 15/003
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E21B 17/00

Drilling rods or pipes; Flexible drill strings; Kellies; Drill collars; Sucker rods; {Cables;} Casings; Tubings

Definition statement

This place covers:

Pipes for use in wellbores, for drilling but also for subsequent operations, such as casings or risers. Couplings between pipes. Centralisers and other accessories for pipes.

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Connecting flow lines to offshore structures	E21B 43/0107
Connecting flow lines to an underwater wellhead	E21B 43/013
Expansible tubulars	E21B 43/103
Details of, or accessories for, portable power-driven percussive tools	B25D 17/00
Rod couplings in general	F16D
Tubes or tube couplings in general	F16L
Repairing or joining pipes on or under water, e.g. subsea flow lines	F16L 1/00
Pipe-line systems	F17D 1/00

E21B 17/003

{with electrically conducting or insulating means ([E21B 17/028](#) and [E21B 17/023](#) take precedence)}

References**Limiting references**

This place does not cover:

Arrangements for connecting cables or wirelines to downhole devices	E21B 17/023
Electrical or electro-magnetic connections	E21B 17/028

Informative references

Attention is drawn to the following places, which may be of interest for search:

Electrically insulated joints or couplings	F16L 25/02
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E21B 17/01**Risers****References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Supporting a riser from a drilling or production platform specially adapted for underwater drilling	E21B 19/004
Riser connectors	E21B 33/038

E21B 17/021

{Devices for subsurface connecting or disconnecting by rotation}

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Connecting or disconnecting pipe couplings or joints	E21B 19/16
Fishing tools for frozen rods, casings, ropes, bits or the like	E21B 31/00

E21B 17/026

{Arrangements for fixing cables or wirelines to the outside of downhole devices}

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Protectors and centralisers for cables and control lines	E21B 17/1035
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E21B 17/042**Threaded****References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Releasing-joints between rod or the like and bit or between rod and rod or the like	E21B 17/06
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E21B 17/05**Swivel joints****References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Swivel joints in hose-lines	E21B 21/02
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E21B 17/06**Releasing-joints, e.g. safety joints****References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Gun or shaped-charge perforators	E21B 43/116
Dropping perforation guns after gun actuation	E21B 43/1193

E21B 17/07**Telescoping joints for varying drill string lengths; Shock absorbers****References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Heave compensators in the derrick	E21B 19/09
Releasing-jars	E21B 31/107
Shock-absorbers in general	F16F

E21B 17/10**Wear protectors; Centralising devices {, e.g. stabilisers}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Drives used in the borehole with anchoring means	E21B 4/18
Guiding or centralising devices outside the borehole	E21B 19/24
Devices for positioning logging sondes with respect to the borehole wall	G01V 11/005

E21B 17/1021**{with articulated arms or arcuate springs}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Measuring diameter of boreholes or wells	E21B 47/08
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E21B 17/14**Casing shoes {for the protection of the bottom of the casing}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Casing shoes having a valve	E21B 21/10
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E21B 17/18**Pipes provided with plural fluid passages {([E21B 17/203](#) takes precedence)}****References****Limiting references***This place does not cover:*

Flexible or articulated drilling pipes with plural fluid passages	E21B 17/203
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Informative references*Attention is drawn to the following places, which may be of interest for search:*

Circulation of drilling fluid by means of such pipes	E21B 21/12
Joints or fittings for double-walled or multi-channel pipes or pipe assemblies	F16L 39/00

E21B 17/20

Flexible or articulated drilling pipes {, e.g. flexible or articulated rods, pipes or cables}

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Risers	E21B 17/01
Swivel joints between rod or the like and bit or between rod and rod or the like	E21B 17/05

E21B 17/206

{with conductors, e.g. electrical, optical}

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Hoses with electrically conducting means in general	F16L 11/127
Flexible electrical cables in boreholes	H01B 7/046

E21B 17/22

Rods or pipes with helical structure

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Drill bits with helical conveying portion	E21B 10/44
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E21B 19/00

Handling rods, casings, tubes or the like outside the borehole, e.g. in the derrick; Apparatus for feeding the rods or cables

Definition statement

This place covers:

Machines or methods performed in the surface for assembling pipes, hoisting pipes, pushing pipes into a borehole, storing pipes and similar. The application is typically for drilling, i.e. vertical, horizontal, deep drilling, mining or other earth drilling, but can also be for well treatment or other.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Surface drives	E21B 1/02 , E21B 3/02
Manipulators mounted on wheels or on carriages	B25J 5/00
Gripping heads	B25J 15/00

E21B 19/002

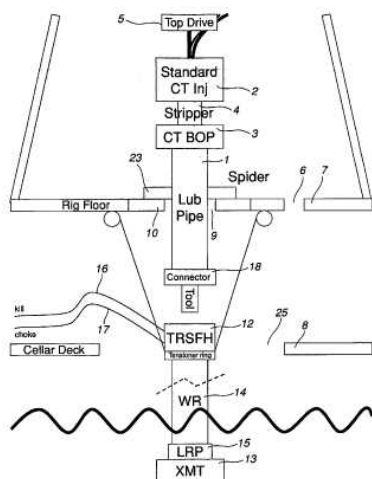
{specially adapted for underwater drilling ([E21B 19/09](#), [E21B 19/143](#) take precedence)}

Definition statement

This place covers:

Handling and supporting of tubulars in relation to underwater drilling operations other than feeding the drill string into the borehole or controlling the weight on bit.

Illustrative example of subject matter classified in this place:



References

Limiting references

This place does not cover:

Apparatus specially adapted for drilling underwater for feeding the rods or cables, increasing or decreasing the pressure on the drilling tool or counterbalancing the weight of the rods	E21B 19/09
Racks, ramps, troughs or bins, for holding the lengths of rod singly or connected, specially adapted for drilling	E21B 19/143

Informative references

Attention is drawn to the following places, which may be of interest for search:

Risers with buoyancy elements	E21B 17/012 , E21B 17/015
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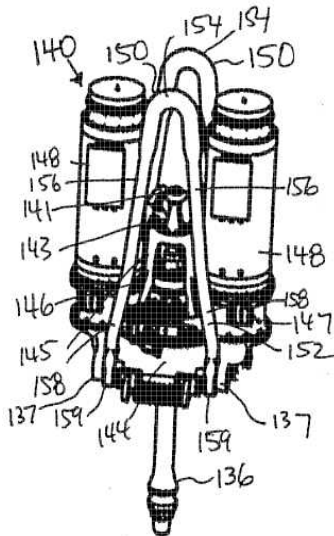
E21B 19/008**{Winding units, specially adapted for drilling operations}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Cathead actuated pipe wrenches or spinners	E21B 19/162
Capstans, winches	B66D

E21B 19/02**Rod or cable suspensions****Definition statement***This place covers:*

Apparatus for suspension by rods or cables that have normally no capacity of applying rotation. A spinner or other rotary drive may be suspended from the suspension apparatus.

Illustrative example of the subject matter classified in this place:

**References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Load-engaging elements for hoisting or lowering purposes in general	B66C 1/00
Tackles, e.g. pulley blocks or crown blocks	B66D
Cable guides	B66D 1/36

E21B 19/07

Slip-type elevators

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Slips in rotary tables	E21B 19/10
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E21B 19/08

Apparatus for feeding the rods or cables ([E21B 19/22](#) takes precedence; automatic feed [E21B 44/02](#)); Apparatus for increasing or decreasing the pressure on the drilling tool; Apparatus for counterbalancing the weight of the rods

Definition statement

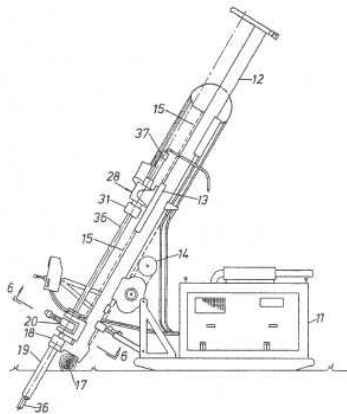
This place covers:

Apparatus for pushing drilling tools into the borehole. All kinds of earth drilling tools are classified in these groups, such as deep drilling tools, rock drills for mining, horizontal drills or coiled tubing.

Apparatus for increasing/decreasing the pressure on the drilling tool.

Apparatus for counterbalancing the weight of the rods.

Illustrative example of the subject matter classified in this place:



References

Limiting references

This place does not cover:

Handling reeled pipe or rod units, e.g. flexible drilling pipes	E21B 19/22
Automatic control of the tool feed	E21B 44/02

Informative references

Attention is drawn to the following places, which may be of interest for search:

Hoisting drums	B66D
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E21B 19/09

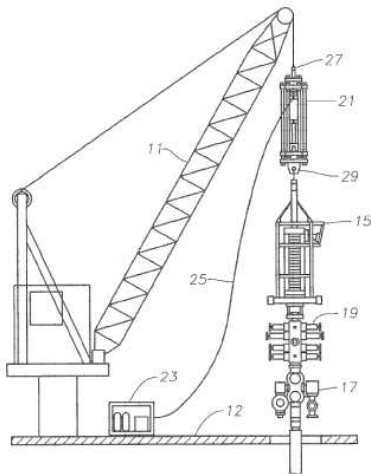
specifically adapted for drilling underwater formations from a floating support using heave compensators supporting the drill string

Definition statement

This place covers:

Feeding the drill string for underwater drilling.

Illustrative example of the subject matter classified in this place:

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Drilling-pipe telescoping joints	E21B 17/07
Heave compensators for supporting a riser	E21B 19/006

E21B 19/10

Slips; Spiders {; Catching devices (rotary tables with master bushing or kelly bushing [E21B 3/04](#))}

References**Limiting references**

This place does not cover:

Rotary tables with master bushing or kelly bushing	E21B 3/04
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Slip-type elevators	E21B 19/07
Casing heads with slips	E21B 33/0422

E21B 19/12

Rope clamps {; Rod, casings or tube clamps not secured to elevators}

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Rope clamps in general	F16G 11/00
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E21B 19/14

Racks, ramps, troughs or bins, for holding the lengths of rod singly or connected; Handling between storage place and borehole ([E21B 19/20](#), [E21B 19/22](#) take precedence)

Definition statement

This place covers:

Storage of rods and handling of rods between storage and a position where the rods can be connected or disconnected.

References**Limiting references**

This place does not cover:

Combined feeding from rack and connecting	E21B 19/20
Handling reeled pipe or rod units	E21B 19/22

Informative references

Attention is drawn to the following places, which may be of interest for search:

Storing elongated articles in general	B65G 1/0442
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E21B 19/16

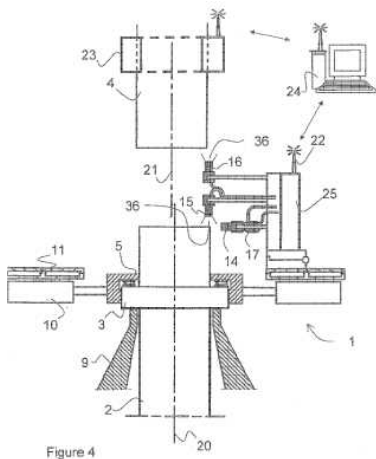
Connecting or disconnecting pipe couplings or joints ([E21B 19/20](#) takes precedence)

Definition statement

This place covers:

Method or apparatus for connecting or disconnecting the rods.

Illustrative example of the subject matter classified in this place:



References

Limiting references

This place does not cover:

Combined feeding from rack and connecting, e.g. automatically	E21B 19/20
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Pipe wrenches or the like	B25B
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E21B 19/162

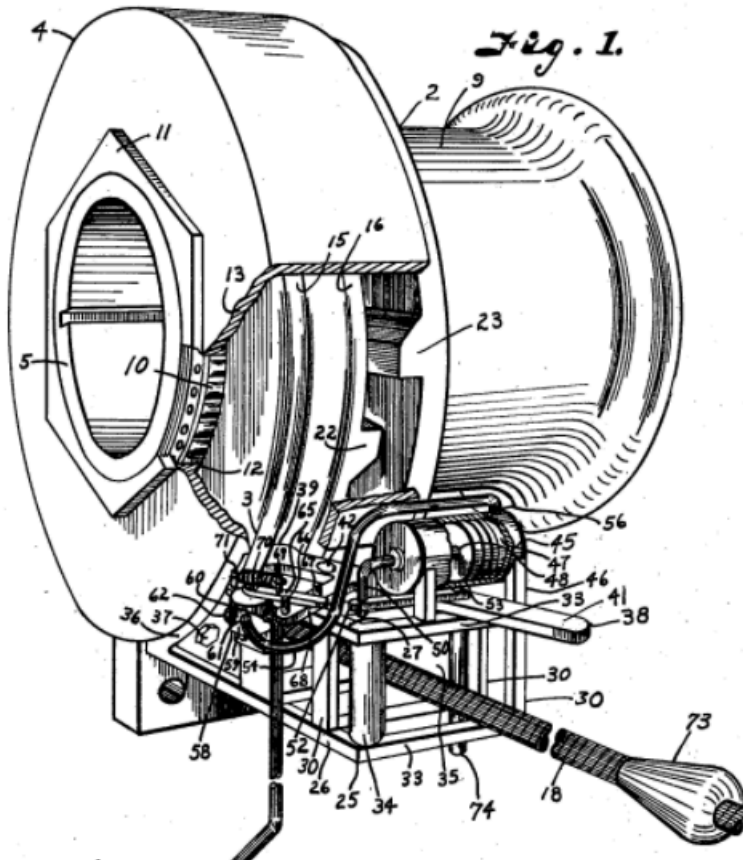
{cathead actuated}

Definition statement

This place covers:

A powered winch system used to tension chains, cables and ropes for actuation of the wrench.

Illustrative example of the subject matter classified in this place:



E21B 19/20

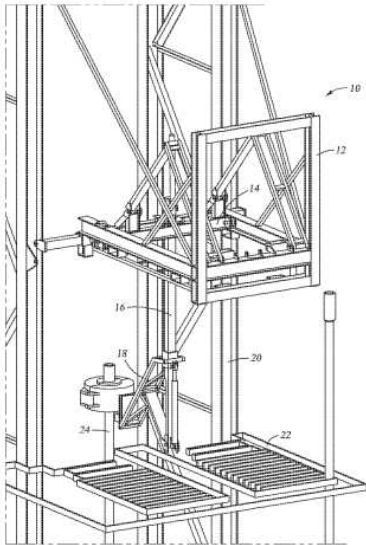
Combined feeding from rack and connecting, e.g. automatically

Definition statement

This place covers:

The combination of feeding from rack and connecting.

Illustrative example of subject matter classified in this place:



E21B 19/24

Guiding or centralising devices for drilling rods or pipes

Definition statement

This place covers:

Devices located at the surface for guiding or centralising drill pipe as it is inserted into a well.

E21B 21/00

Methods or apparatus for flushing boreholes, e.g. by use of exhaust air from motor (freeing objects stuck in boreholes by flushing [E21B 31/03](#))

Definition statement

This place covers:

Control of circulation and pressure of fluids in a borehole, typically drilling fluids, tools for filling a borehole, treatment of drill cuttings, various types of drilling fluids.

References

Limiting references

This place does not cover:

Freeing objects stuck in boreholes by flushing	E21B 31/03
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Cementing	E21B 33/13
Enhanced recovery methods	E21B 43/16
Fracturing formations	E21B 43/26

Destroying or transforming solid or contaminated waste into something useful or harmless	B09B 3/00
Floating drilling platforms, e.g. carrying water-oil separating devices	B63B 35/4413
Well drilling compositions	C09K 8/02

E21B 21/01

Arrangements for handling drilling fluids or cuttings outside the borehole, e.g. mud boxes

Definition statement

This place covers:

Handling drilling fluids or cuttings outside the borehole without modification to the composition of the drilling fluid.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Swivel joints in hose-lines	E21B 21/02
Arrangements for treating drilling fluids	E21B 21/06
Waste disposal systems	E21B 41/005

E21B 21/019

{Arrangements for maintaining circulation of drilling fluid while connecting or disconnecting tubular joints}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Valve arrangements in drilling fluid circulation systems in general	E21B 21/10
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E21B 21/02

Swivel joints in hose-lines

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Hose connections in general	F16L 31/00 , F16L 33/00
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E21B 21/06**Arrangements for treating drilling fluids outside the borehole****Definition statement**

This place covers:

Treating drilling fluid outside the borehole in a way that modifies the composition of the drilling fluid. This includes drilling fluid exiting the well and new drilling fluid introduced into the well.

E21B 21/062

{by mixing components}

Definition statement

This place covers:

Treating drilling fluids and wellbore treatment fluids by mixing in new or additional components.

E21B 21/067

{Separating gases from drilling fluids}

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Materials not provided for elsewhere for treating liquid pollutants, e.g. oil, gasoline or fat	C09K 3/32
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E21B 21/10**Valve arrangements in drilling-fluid circulation systems****References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Valves specifically for maintaining circulation of drilling fluid while connecting or disconnecting tubular joints	E21B 21/019
Valves in general	F16K

E21B 21/103

{Down-hole by-pass valve arrangements, i.e. between the inside of the drill string and the annulus (valves specifically for maintaining circulation of drilling fluid while connecting or disconnecting tubular joints [E21B 21/019](#))}

References

Limiting references

This place does not cover:

Valves specifically for maintaining circulation of drilling fluid while connecting or disconnecting tubular joints	E21B 21/019
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Cementing valves	E21B 33/14
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E21B 21/12

using drilling pipes with plural fluid passages, e.g. closed circulation systems

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Pipes with plural fluid passages	E21B 17/18
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E21B 21/16

using gaseous fluids ([E21B 21/14](#) takes precedence)

References

Limiting references

This place does not cover:

Methods or apparatus for flushing boreholes using liquids and gases, e.g. foams	E21B 21/14
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Arrangements for handling drilling fluids outside the borehole	E21B 21/01
Arrangements for treating drilling fluids	E21B 21/06

E21B 23/00

Apparatus for displacing, setting, locking, releasing or removing tools, packers or the like in boreholes or wells (setting of casings, screens or liners [E21B 43/10](#))

Definition statement

This place covers:

Actuators for installing tools used for any application in a borehole, wherein the way of installation is more relevant than the function of the tool as such.

References

Limiting references

This place does not cover:

Setting of casings, screens or liners	E21B 43/10
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Borehole thrusters	E21B 4/18 , E21B 44/005
Fishing for or freeing objects in boreholes or wells	E21B 31/00

Special rules of classification

If a document discloses specific details of actuation or installation according to the meaning of [E21B 23/00](#), and the actuation is done by elements incorporated in the tool, then those details are also classified in [E21B 23/00](#).

The tool in question may in addition be classified in the group that corresponds to its function or construction.

E21B 23/001

{Self-propelling systems or apparatus, e.g. for moving tools within the horizontal portion of a borehole}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Self-propelled fluid operated hammers	E21B 4/145
Burrowing devices	E21B 7/26
Self-contained pigs	F16L 55/32

E21B 23/01

for anchoring the tools or the like ([E21B 23/02](#) - [E21B 23/06](#) take precedence; anchoring of drives in the borehole [E21B 4/18](#))

References

Limiting references

This place does not cover:

Anchoring of drives in the borehole	E21B 4/18
Apparatus for locking the tools or the like in landing nipples or in recesses between adjacent sections of tubing	E21B 23/02
Apparatus for setting the tools into, or removing the tools from, laterally offset landing nipples or pockets	E21B 23/03
Apparatus operated by fluid means	E21B 23/04
Apparatus for setting packers	E21B 23/06

Informative references

Attention is drawn to the following places, which may be of interest for search:

Packers	E21B 33/12
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E21B 23/06

for setting packers

Definition statement

This place covers:

Tools for setting packers, detachable from the packer.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Setting by fluid means	E21B 23/04
Setting means incorporated into packers	E21B 33/10

E21B 23/08

Introducing or running tools by fluid pressure, e.g. through-the-flow-line tool systems

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Tool diverters	E21B 23/12
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Informative references

Special provisions on heads for introducing objects or fluids into, or removing objects from, wells	E21B 33/068
Cementing plugs	E21B 33/16
Scrapers operated by fluid pressure	E21B 37/04

E21B 23/12**Tool diverters****Definition statement**

This place covers:

Tool diverters, e.g. for through-the-flow line tool systems or for wire-line tools

References**Application-oriented references**

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Tool diverters for drilling	E21B 7/06
Tool diverters for setting the tools into, or removing the tools from, laterally offset landing nipples or pockets	E21B 23/03

E21B 23/14**for displacing a cable or a cable-operated tool, e.g. for logging or perforating operations in deviated wells****References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

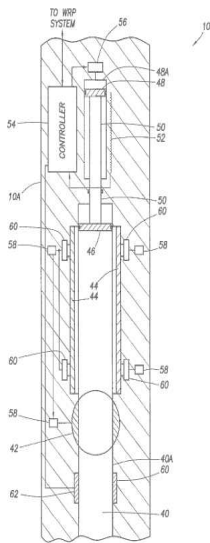
Side entry subs for connecting cables or wirelines to downhole devices	E21B 17/025
Control line protectors for plural rods, pipes or lines	E21B 17/1035
Surface apparatus for feeding cables	E21B 19/08
Introducing or running tools by fluid pressure, e.g. through-the-flow-line tool systems	E21B 23/08
Provision on well heads for introducing or removing cable-operated tools	E21B 33/072 , E21B 33/076

E21B 25/00**Apparatus for obtaining or removing undisturbed cores, e.g. core barrels or core extractors (core bits [E21B 10/02](#))****Definition statement**

This place covers:

Tools for receiving, preserving, transporting, etc., a core.

Illustrative example of the subject matter classified in this place:



References

Limiting references

This place does not cover:

Core bits	E21B 10/02
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Methods or apparatus for obtaining samples of soil or well fluids, specially adapted to earth drilling or wells, using explosives or projectiles in boreholes	E21B 49/04
Side-wall sampling or coring	E21B 49/06

E21B 25/005

{Above ground means for handling the core, e.g. for extracting the core from the core barrel}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Investigating or analysing materials by determining their chemical or physical properties, e.g. testing of core samples per se and devices therefore	G01N
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E21B 25/02

the core receiver being insertable into, or removable from, the borehole without withdrawing the drilling pipe

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Retrievable drill bits	E21B 10/64
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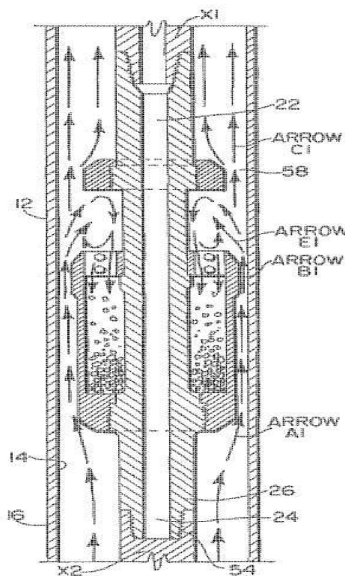
E21B 27/00

Containers for collecting or depositing substances in boreholes or wells, e.g. bailers, {baskets or buckets} for collecting mud or sand; Drill bits with means for collecting substances, e.g. valve drill bits

Definition statement

This place covers:

Illustrative example of subject matter classified in this place:



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Junk baskets for fishing	E21B 31/08
--------------------------	----------------------------

E21B 27/04

where the collecting or depositing means include helical conveying means

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Drilling with helical conveying means combined with bucket-type container	E21B 7/006
---	----------------------------

E21B 28/00

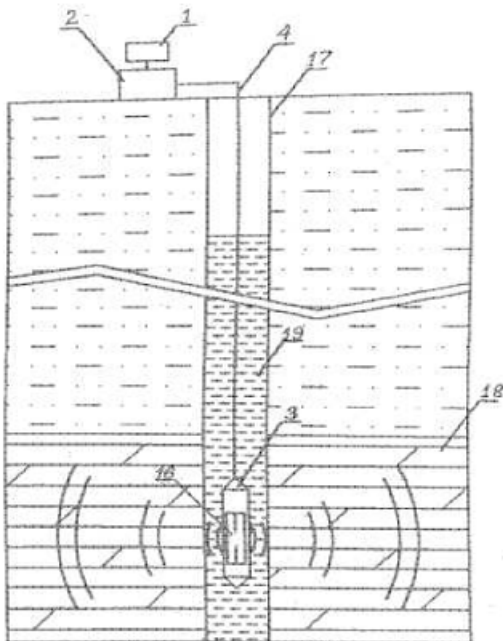
Vibration generating arrangements for boreholes or wells, e.g. for stimulating production (for fishing for or freeing objects [E21B 31/005](#);) for transmitting measuring-signals [E21B 47/14](#); for geophysical measurements [G01V 1/02](#))

Definition statement

This place covers:

The vibration is normally generated by tools inside the borehole.

Illustrative example of the subject matter classified in this place:

**References****Limiting references**

This place does not cover:

Vibration for fishing for or freeing objects	E21B 31/005
--	-----------------------------

Limiting references

Means for transmitting measuring-signals or control signals from the well to the surface, or from the surface to the well, e.g. for logging while drilling, using acoustic waves	E21B 47/14
Generating seismic energy for geophysical measurements	G01V 1/02

Informative references

Attention is drawn to the following places, which may be of interest for search:

Vibration for drilling	E21B 7/24
Vibrating earth formations	E21B 43/003
Generating vibrations in general	B06B

E21B 29/00

Cutting or destroying pipes, packers, plugs or wire lines, located in boreholes or wells, e.g. cutting of damaged pipes, of windows; Deforming of pipes in boreholes or wells; Reconditioning of well casings while in the ground

Definition statement

This place covers:

Cutting or deforming methods and apparatus for pipes, lines etc. inside the wellbore.

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Reconditioning of well casings while in the ground by enlarging drilled holes or counterboring	E21B 7/28
Shear-type blow-out preventers	E21B 33/063
Expanding tubulars	E21B 43/103
Perforators	E21B 43/11

E21B 29/02

by explosives or by thermal or chemical means {(freeing stuck objects by explosives [E21B 31/002](#))}

References**Limiting references**

This place does not cover:

Freeing stuck objects by explosives	E21B 31/002
-------------------------------------	-----------------------------

Informative references

Attention is drawn to the following places, which may be of interest for search:

Destroying objects in boreholes or wells by explosives	E21B 31/16
--	----------------------------

E21B 29/06

Cutting windows, e.g. directional window cutters for whipstock operations
(**{E21B 29/005 and} E21B 29/08** take precedence)

References**Limiting references**

This place does not cover:

Cutting a pipe with a cutter rotating along the circumference of the pipe with a radially-expansible cutter rotating inside the pipe	E21B 29/005
Cutting or deforming pipes to control fluid flow	E21B 29/08

Informative references

Attention is drawn to the following places, which may be of interest for search:

Whipstocks	E21B 7/061
------------	----------------------------

E21B 29/08

Cutting or deforming pipes to control fluid flow

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Blow-out preventers	E21B 33/06
Shear type blow-out preventers	E21B 33/063

E21B 29/10

Reconditioning of well casings, e.g. straightening

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Enlarging drilled holes, e.g. counterboring	E21B 7/28
Expanding tools for setting expansible casings, liners, screens or the like	E21B 43/105

E21B 31/00

Fishing for or freeing objects in boreholes or wells

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Provisions on well heads for introducing or removing objects	E21B 33/068
Locating or determining the position of objects in boreholes or wells	E21B 47/09

E21B 31/002

{Destroying the objects to be fished, e.g. by explosive means}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Cutting by explosive	E21B 29/02
----------------------	----------------------------

E21B 31/005

{using vibrating or oscillating means}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Vibration generating arrangements for boreholes or wells	E21B 28/00
--	----------------------------

E21B 31/035

{controlling differential pipe sticking}

Definition statement

This place covers:

Processes for unsticking the pipe from the wellbore wall by, for example, applying force to pipe, lowering pressure in the wellbore or using treatment fluid.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Additives for releasing stuck drill pipe	C09K 2208/02
--	------------------------------

E21B 31/107

using impact means for releasing stuck parts, e.g. jars

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Downhole impacting means	E21B 4/06
Telescoping joints	E21B 17/07

E21B 31/14

with means deflecting the direction of the tool, e.g. by use of knuckle joints

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Apparatus for deflecting the boring	E21B 7/06
-------------------------------------	---------------------------

E21B 31/16

combined with cutting or destroying means

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Cutting or destroying means per se	E21B 29/00
------------------------------------	----------------------------

E21B 31/18

gripping externally, e.g. overshot

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Construction of grippers for machine tools	B23Q 7/043
Gripping heads, Manipulators in general	B25J 15/00
Gripping members for cranes	B66C 1/42

E21B 33/00

Sealing or packing boreholes or wells

Definition statement

This place covers:

Apparatus and methods for sealing, both at the surface and in the interior of a borehole

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Apparatus or methods for producing mixtures of cement with other substances, e.g. slurries, mortars, porous or fibrous compositions	B28C 5/00
---	---------------------------

Special rules of classification

Pitless wells are also classified in [E21B 33/00](#)

E21B 33/02

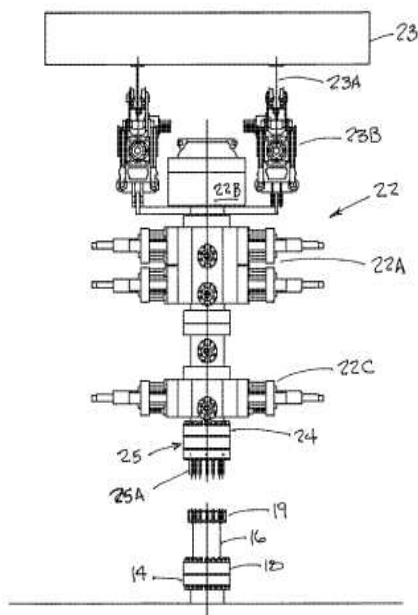
Surface sealing or packing

Definition statement

This place covers:

Apparatus for sealing a wellbore and placed outside the wellbore, be it at the surface or subsea, such as wellheads, casing or tubing hangers,

Christmas trees or blow-out preventers:



E21B 33/03**Well heads; Setting-up thereof****References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Valve arrangements for boreholes or wells	E21B 34/02
---	----------------------------

E21B 33/0375**{Corrosion protection means}****References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Corrosion protection means in general	C23F
---------------------------------------	----------------------

E21B 33/038**Connectors used on well heads, e.g. for connecting blow-out preventer and riser****References****Application-oriented references**

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Connecting a production flow line to an underwater well head	E21B 43/013
--	-----------------------------

E21B 33/0385**{electrical connectors}****References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Underwater electrical connections in general	H01R 13/523
--	-----------------------------

E21B 33/04**Casing heads; Suspending casings or tubings in well heads****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Setting of casings in wells	E21B 43/10
-----------------------------	----------------------------

E21B 33/0422**{a suspended tubing or casing being gripped by a slip or an internally serrated member}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Slips in rotary table	E21B 19/10
-----------------------	----------------------------

E21B 33/06**Blow-out preventers {, i.e. apparatus closing around a drill pipe, e.g. annular blow-out preventers (rotating blow-out preventers [E21B 33/085](#))}****References****Limiting references***This place does not cover:*

Rotating blow-out preventers	E21B 33/085
------------------------------	-----------------------------

Informative references*Attention is drawn to the following places, which may be of interest for search:*

Valve arrangements for boreholes or wells	E21B 34/00
Control systems for blow-out preventers	E21B 34/16

E21B 33/063**{for shearing drill pipes (cutting of wireline [E21B 29/04](#))}****References****Limiting references***This place does not cover:*

Cutting of wireline	E21B 29/04
---------------------	----------------------------

Informative references

Attention is drawn to the following places, which may be of interest for search:

Cutting pipes	E21B 29/08
---------------	----------------------------

E21B 33/064

especially adapted for underwater well heads

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Control systems, e.g. hydraulic, pneumatic, electric, acoustic, for submerged well heads	E21B 33/0355
Connectors used on well heads, e.g. for connecting blow-out preventer and riser	E21B 33/038

E21B 33/068

having provision for introducing objects or fluids into, or removing objects from, wells (cementing-heads [E21B 33/05](#))

References**Limiting references**

This place does not cover:

Cementing-heads, e.g. having provision for introducing cementing plugs	E21B 33/05
--	----------------------------

Informative references

Attention is drawn to the following places, which may be of interest for search:

Wipers; Oil savers	E21B 33/08
Launching or retrieval of pigs or moles	F16L 55/46

E21B 33/08

Wipers; Oil savers

Definition statement

This place covers:

Wipers, oil savers and stuffing boxes.

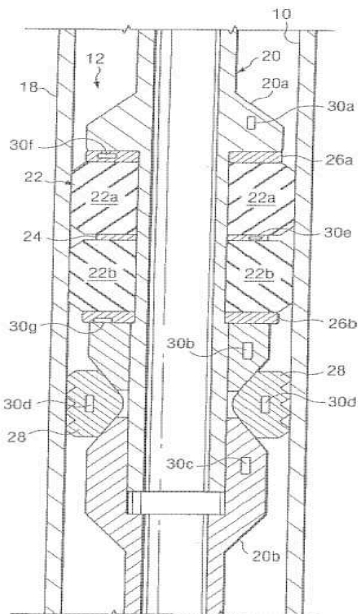
E21B 33/12

Packers; Plugs (used for cementing [E21B 33/134](#), [E21B 33/16](#))

Definition statement

This place covers:

Packers, tools lowered with a reduced diameter and expanded by various means to establish an annular seal between an outer tubular or wall and an inner tubular:



References

Limiting references

This place does not cover:

Bridging plugs for cementing	E21B 33/134
Using plugs for isolating cement charge	E21B 33/16

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Locking packers or plugs in landing nipples	E21B 23/02
---	----------------------------

E21B 33/1212

{including a metal-to-metal seal element}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Metal packing seals in general	F16J 15/08
--------------------------------	----------------------------

E21B 33/128

with a member expanded radially by axial pressure ([E21B 33/122](#), [E21B 33/124](#) take precedence)

References

Limiting references

This place does not cover:

Multiple string packers	E21B 33/122
Units with longitudinally-spaced plugs for isolating the intermediate space	E21B 33/124

Informative references

Attention is drawn to the following places, which may be of interest for search:

Packers or plugs characterised by the construction of the sealing or packing means	E21B 33/1208
--	------------------------------

E21B 33/13

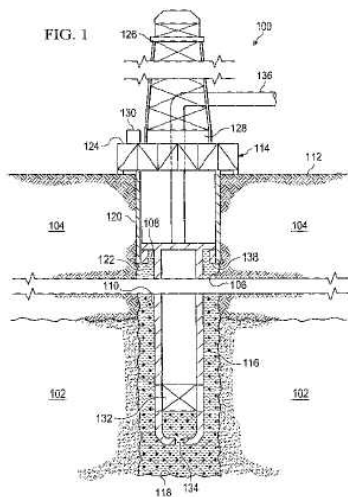
Methods or devices for cementing, for plugging holes, crevices or the like

Definition statement

This place covers:

Tools for plugging the bore or a well, and to methods for cementing parts of a wellbore, for cementing a casing in the wellbore and similar.

Illustrative example of the subject matter classified in this place:



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Dump bailers	E21B 27/02
--------------	----------------------------

Chemical compositions for cementing, plugging holes, crevices or the like	C09K 8/00
Methods or apparatus for grouting offshore structures	E02B 17/0008

E21B 33/134

Bridging plugs

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Packers	E21B 33/12
---------	----------------------------

E21B 33/138

Plastering the borehole wall; Injecting into the formation

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Packers	E21B 33/12
Consolidation of loose sand or the like round the wells without excessively decreasing the permeability thereof	E21B 43/025
Compositions for plastering the borehole wall	C09K 8/56

E21B 33/14

for cementing casings into boreholes

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Control of cementation quality or level	E21B 47/005
Compositions for cementing	C09K 8/42

E21B 34/00

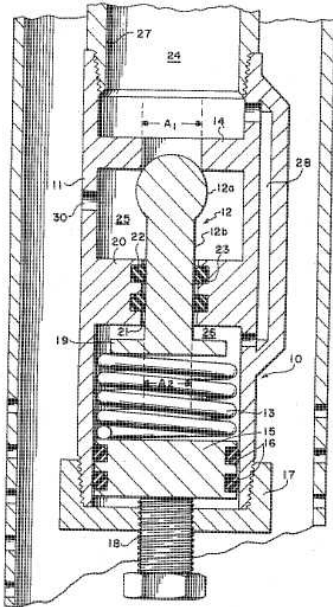
Valve arrangements for boreholes or wells

Definition statement

This place covers:

Constructive details of valves specifically adapted for use at the surface of a wellbore or in the interior of a wellbore.

Illustrative example of the subject matter classified in this place:



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Valve arrangements in drilling fluid circulation systems	E21B 21/10
Tool diverters	E21B 23/12
Valve drill bits	E21B 27/00
Blow-out preventers	E21B 33/06
Oil flow regulating apparatus	E21B 43/12
Gas lift valves	E21B 43/123
Valves in general	F16K

E21B 34/10

operated by control fluid supplied from outside the borehole

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Control means being outside the borehole	E21B 34/16
--	----------------------------

E21B 34/16

Control means therefor being outside the borehole {(control systems for submerged well heads [E21B 33/0355](#))}

Definition statement

This place covers:

Means for controlling valves in wellheads, downhole valves, blow out preventers.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Fluid-pressure systems with accumulators	F15B 1/00
--	---------------------------

E21B 35/00

Methods or apparatus for preventing or extinguishing fires

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Cutting or deforming pipes to control fluid flow	E21B 29/08
Controlling flow of fluid to or in wells	E21B 43/12
Fire fighting in general	A62C , A62D
Prevention of fires in mines or tunnels	E21F 5/00

E21B 36/00

Heating, cooling or insulating arrangements for boreholes or wells, e.g. for use in permafrost zones

Definition statement

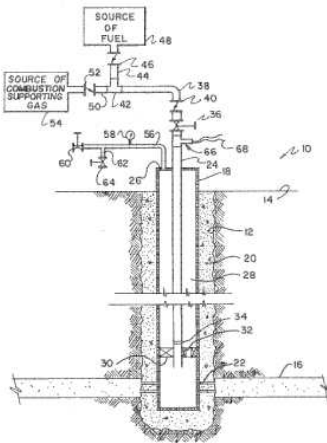
This place covers:

Equipment for heating or cooling a wellbore, either at the surface or from within the wellbore.

Heating or cooling fluid produced or treatment fluids in the wellbore.

Definition statement

Illustrative example of the subject matter classified in this place:



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Drilling by use of heat	E21B 7/14
Secondary recovery methods using heat	E21B 43/24

Special rules of classification

If a document describes the extension of the heating action into a reservoir or formation for enhanced recovery, then this operation is classified in [E21B 43/24](#).

E21B 36/001

{Cooling arrangements}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Cooling of downhole sensors/electronics	E21B 47/0175
---	------------------------------

E21B 37/00

Methods or apparatus for cleaning boreholes or wells ([E21B 21/00](#) takes precedence)

Definition statement

This place covers:

Methods or apparatus for cleaning boreholes or wells. Cleaning by physical or chemical action.

Illustrative example of the subject matter classified in this place:

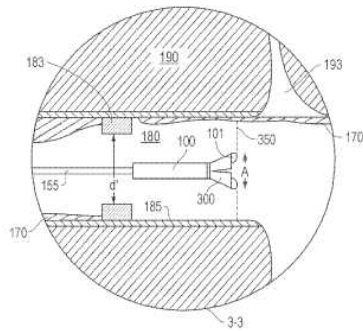


FIG. 3

References

Limiting references

This place does not cover:

Methods or apparatus for flushing boreholes, e.g. by use of exhaust air from motor	E21B 21/00
--	----------------------------

Informative references

Attention is drawn to the following places, which may be of interest for search:

Bailers	E21B 27/00
Inhibition of corrosion	E21B 41/02
Cleaning pipes in general	B08B 9/02

E21B 37/04

operated by fluid pressure, e.g. free-piston scrapers

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Introducing or running tools by fluid pressure, e.g. through-the-flow-line tool systems	E21B 23/08
---	----------------------------

E21B 37/06

using chemical means for preventing or limiting {, e.g. eliminating,} the deposition of paraffins or like substances

Definition statement

This place covers:

The use of chemical means for preventing, limiting, or removing substances such as paraffins and filter cakes from the wellbore.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Compositions for preventing, limiting or eliminating depositions, e.g. for cleaning	C09K 8/52
---	---------------------------

E21B 37/10

Well swabs

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Pistons in general	F16J 1/00
--------------------	---------------------------

E21B 40/00

Tubing catchers, automatically arresting the fall of oil-well tubing {(preventing small objects from falling into the borehole [E21B 41/0021](#))}

Definition statement

This place covers:

Tubing catchers, automatically arresting the fall of oil-well tubing

References

Limiting references

This place does not cover:

Preventing small objects from falling into the borehole	E21B 41/0021
---	------------------------------

Informative references

Attention is drawn to the following places, which may be of interest for search:

Slips, spiders	E21B 19/10
----------------	----------------------------

E21B 41/00

Equipment or details not covered by groups [E21B 15/00](#) - [E21B 40/00](#)

Definition statement

This place covers:

- Equipment as specified in the subgroups of [E21B 41/00](#).
- Equipment specifically adapted for use in earth drilling and not covered by other groups of [E21B](#) or by the subgroups of [E21B 41/00](#).
- Timers and actuators.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Power stations, adaptations for drilling wells	F03B 13/00
Fuel cells; Manufacture thereof	H01M 8/00

Special rules of classification

The technical field [E21B](#) is an application field, wherein many different tools performing various functions find use. Care should be taken not to classify in [E21B 41/00](#) documents describing methods or apparatus marginally related to oil and gas drilling and production for which no suitable class in [E21B](#) can be found. Such documents should instead be classified in the groups corresponding to their specific function.

E21B 41/0035

{Apparatus or methods for multilateral well technology, e.g. for the completion of or workover on wells with one or more lateral branches}

References

References out of a residual place

Examples of places in relation to which this place is residual:

Tool diverters	E21B 23/12
Cutting casing windows	E21B 29/06

Informative references

Attention is drawn to the following places, which may be of interest for search:

Whipstocks	E21B 7/061
Specific well pattern	E21B 43/30

E21B 41/005

{Waste disposal systems}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Collecting oil or the like from a submerged leakage	E21B 43/0122
Treating radioactively contaminated material; Decontamination arrangements therefor	G21F 9/00

E21B 41/0057**{Disposal of a fluid by injection into a subterranean formation}****References****Application-oriented references**

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Disposal of radioactively contaminated liquid waste by storage in the ground	G21F 9/24
--	---------------------------

Informative references

Attention is drawn to the following places, which may be of interest for search:

Disposal of solid waste	B09B
Reclamation of contaminated soil	B09C
Storing fluid in natural or artificial cavities or chambers in the earth	B65G 5/00
Storing fluid in porous layers	B65G 5/005

E21B 41/0078

{Nozzles used in boreholes (drilling by liquid or gas jets [E21B 7/18](#); drill bits with nozzles [E21B 10/60](#); perforators using direct fluid action [E21B 43/114](#); obtaining a slurry of minerals using nozzles [E21B 43/29](#))}

References**Limiting references**

This place does not cover:

Drilling by liquid or gas jets	E21B 7/18
Drill bits with nozzle	E21B 10/60
Perforators using direct fluid action	E21B 43/114
Obtaining a slurry of minerals using nozzles	E21B 43/29

Informative references

Attention is drawn to the following places, which may be of interest for search:

Nozzles in general	B05B
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E21B 41/0085**{Adaptations of electric power generating means for use in boreholes}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Generation of electric power per se	H02
-------------------------------------	---------------------

E21B 41/02**in situ inhibition of corrosion in boreholes or wells****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Dump bailer	E21B 27/02
Compositions for in situ inhibition of corrosion in boreholes or wells	C09K 8/54
Inhibiting corrosion in general	C23F

E21B 41/04**Manipulators for underwater operations, e.g. temporarily connected to well heads****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Manipulators in general	B25J
-------------------------	----------------------

E21B 41/06**Work chambers for underwater operations, e.g. temporarily connected to well heads****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Equipment for dwelling or working under water	B63C 11/00
---	----------------------------

E21B 43/00

Methods or apparatus for obtaining oil, gas, water, soluble or meltable materials or a slurry of minerals from wells (applicable only to water [E03B](#))

Definition statement

This place covers:

Methods and equipment for completion of wellbores and control and improvement of production.

References

Limiting references

This place does not cover:

Installations or methods for obtaining, collecting or distributing water	E03B
--	----------------------

Informative references

Attention is drawn to the following places, which may be of interest for search:

Survey of wellbore pump systems	E21B 47/008
Obtaining oil-bearing deposits or soluble or meltable materials by mining techniques	E21C 41/00
Pumps	F04
Pumping liquids and elastic fluids at the same time, e.g. multiphase pumps	F04D 31/00
Jet pumps	F04F 5/00

Special rules of classification

Enhanced recovery methods ([E21B 43/16](#)), methods for stimulating production ([E21B 43/25](#)) and methods of fracturing ([E21B 43/26](#)) are sometimes carried out on the basis of specific chemical compositions. In these cases, the use of those compositions is classified respectively in [C09K 8/58](#), [C09K 8/60](#) and [C09K 8/62](#).

E21B 43/003

{Vibrating earth formations}

Definition statement

This place covers:

Processes for inducing vibrations in earth formations using tools inside the borehole or at the surface.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Vibration generating arrangements for boreholes or wells	E21B 28/00
--	----------------------------

E21B 43/006

{Production of coal-bed methane ([E21B 43/243](#) takes precedence)}

References

Limiting references

This place does not cover:

Enhanced recovery methods for obtaining hydrocarbons using heat with combustion in situ	E21B 43/243
---	-----------------------------

Informative references

Attention is drawn to the following places, which may be of interest for search:

Methods or devices for drawing-off gases for safety purposes in mines	E21F 7/00
---	---------------------------

E21B 43/01

especially adapted for obtaining from underwater installations

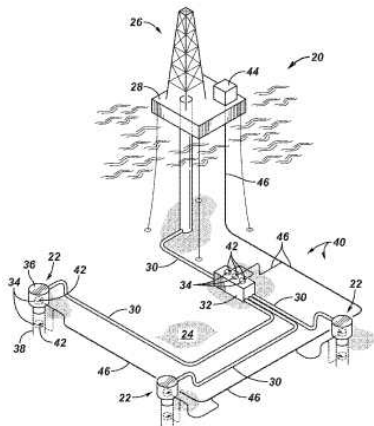
Definition statement

This place covers:

Methods specially adapted for obtaining from underwater installations;

Illustrative example of the subject matter classified in this place:

Subsea production equipment



Relationships with other classification places

Group [E21B 43/01](#) covers all aspects of obtaining fluids or the like from underwater installations except for details of underwater well heads. Details of individual underwater well heads are classified in group [E21B 33/035](#). A plurality of underwater satellite well heads connected to a central station is classified in group [E21B 43/017](#).

Connectors used on underwater well heads are classified in group [E21B 33/038](#), but the connection of a production flow line to an underwater well head is classified in group [E21B 43/013](#).

Multiple classification across the groups mentioned in the paragraphs above may be appropriate.

E21B 43/017

Production satellite stations, i.e. underwater installations comprising a plurality of satellite well heads connected to a central station

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Underwater separating arrangements	E21B 43/36
------------------------------------	----------------------------

E21B 43/02

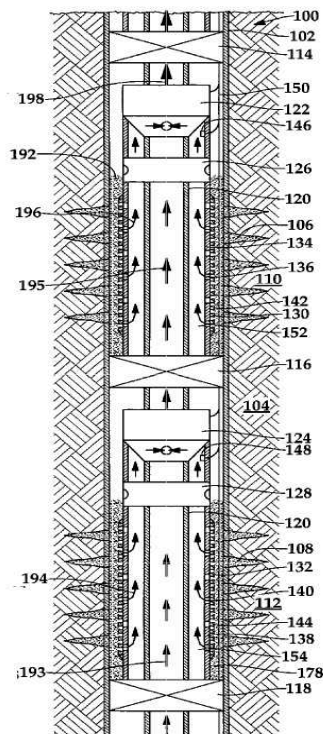
Subsoil filtering

Definition statement

This place covers:

- Subsoil filtering;
- Production screens and gravelling.

Illustrative example of the subject matter classified in this place:



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Perforators; Permeators	E21B 43/11
Chemical compositions for consolidating loose sand or the like around wells	C09K 8/56

E21B 43/025

{Consolidation of loose sand or the like round the wells without excessively decreasing the permeability thereof}

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Sealing borehole walls	E21B 33/138
------------------------	-----------------------------

E21B 43/04

Gravelling of wells

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Graveling of drinking water wells	E03B 3/24
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E21B 43/08

Screens or liners {(expandable screens or liners [E21B 43/108](#))}

References**Limiting references**

This place does not cover:

Expandable screens or liners	E21B 43/108
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Separation, filters in general	B01D
Obtaining drinking water using well filters	E03B 3/18

E21B 43/10

Setting of casings, screens, liners {or the like} in wells

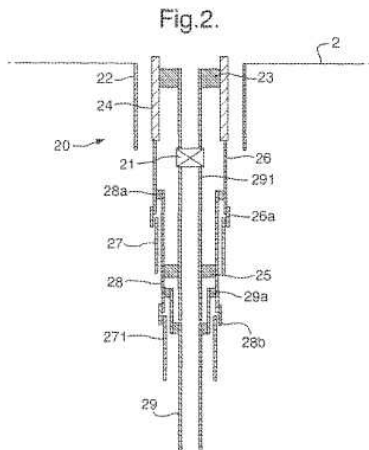
Definition statement

This place covers:

Setting and securing of casings, screens, liners or the like in wells.

Running in and installation of tubulars, expandable tubulars.

Illustrative example of the subject matter classified in this place:



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Driving or forcing casings into boreholes, simultaneously drilling and casing boreholes	E21B 7/20
Setting of tools, packers or the like	E21B 23/00
Suspending casings in well heads	E21B 33/04

E21B 43/105

{Expanding tools specially adapted therefor}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Tube expanders in general	B21D 39/08
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E21B 43/11

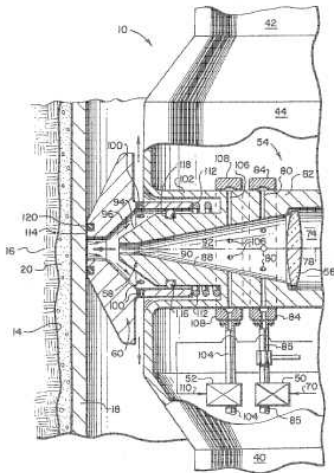
Perforators; Permeators

Definition statement

This place covers:

Perforators and guns used to create apertures in casing or formation in order to establish a fluid communication with the reservoir for the production of oil or gas. Included are details about construction, ignition, communication and placement.

Illustrative example of subject matter classified in this place:



E21B 43/116

Gun or shaped-charge perforators

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Projectiles with shaped or hollow charge	F42B 12/10
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E21B 43/1185

Ignition systems

Definition statement

This place covers:

Ignition systems, e.g. electrically-actuated.

E21B 43/1193

{Dropping perforation guns after gun actuation}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Releasing-joints between rod or the like and bit or between rod and rod or the like	E21B 17/06
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E21B 43/12

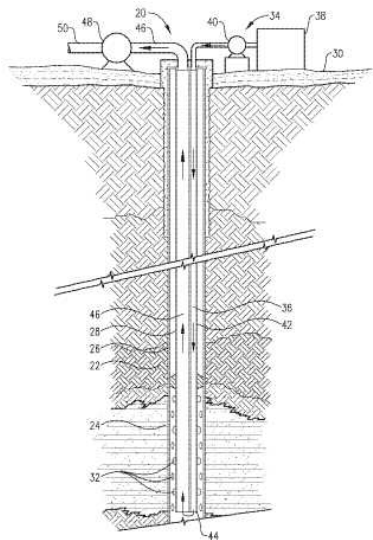
Methods or apparatus for controlling the flow of the obtained fluid to or in wells
([E21B 43/25](#) takes precedence; valve arrangements [E21B 34/00](#))

Definition statement

This place covers:

Production pumps, lifting wellbore fluids, production chokes.

Illustrative example of the subject matter classified in this place:



References

Limiting references

This place does not cover:

Valve arrangements for boreholes or wells	E21B 34/00
Methods for stimulating production	E21B 43/25

E21B 43/121

{Lifting well fluids (monitoring of down-hole pump systems [E21B 47/008](#))}

Definition statement

This place covers:

The use of fluid from outside the well, or tool or system to move obtained fluid to the surface.

References

Limiting references

This place does not cover:

Monitoring of down-hole pump systems	E21B 47/008
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Pumping installations for raising fluid from great depths	F04B 47/00
Positive displacement pumps for downhole pumping	F04C 13/008
Non-positive displacement pumps for use in mining bore holes	F04D 13/10

E21B 43/122

{Gas lift}

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Pumps using pressurised fluid medium acting on the surface of the liquid to be pumped from a great depth	F04F 1/08
Pumps using pressurised fluid medium being mixed with liquid being pumped from a great depth	F04F 1/20

E21B 43/124

{Adaptation of jet-pump systems}

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Jet pumps in general	F04F 5/00
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E21B 43/127

{Adaptations of walking-beam pump systems}

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Driving of walking beam	F04B 47/022
Details of the walking beam	F04B 47/028

E21B 43/16

Enhanced recovery methods for obtaining hydrocarbons

Definition statement

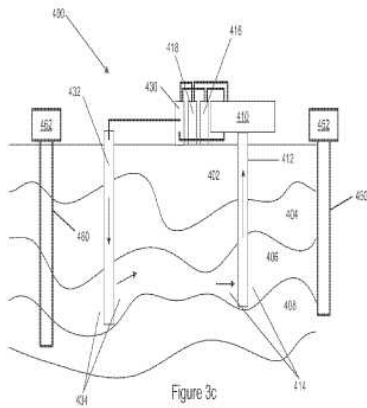
This place covers:

Injecting fluids to mobilize hydrocarbons towards a production well.

Definition statement

Increasing the fraction of original oil recovered in place in a reservoir, including waterflooding, chemical flooding, gas injection, and thermal methods.

Illustrative example of the subject matter classified in this place:



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Fracturing	E21B 43/26
Obtaining slurry	E21B 43/29
Reclamation of contaminated soil in situ	B09C
Chemical compositions therefor	C09K 8/58

E21B 43/17

Interconnecting two or more wells by fracturing or otherwise attacking the formation ([E21B 43/2405](#), [E21B 43/247](#) take precedence)

References

Limiting references

This place does not cover:

Enhanced recovery methods for obtaining hydrocarbons using heat, e.g. steam injection, in association with fracturing or crevice forming processes	E21B 43/2405
Enhanced recovery methods for obtaining hydrocarbons using combustion in situ in association with fracturing processes or crevice forming processes	E21B 43/247

Informative references

Attention is drawn to the following places, which may be of interest for search:

Fracturing per se	E21B 43/26
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E21B 43/24

using heat, e.g. steam injection

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Heating, cooling or insulating wells	E21B 36/00
Compositions for enhanced recovery methods for obtaining hydrocarbons used in combination with generated heat	C09K 8/592

E21B 43/2403

{by means of nuclear energy}

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Nuclear reactors	G21
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E21B 43/247

in association with fracturing processes {or crevice forming processes}

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Fracturing per se	E21B 43/26
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E21B 43/25

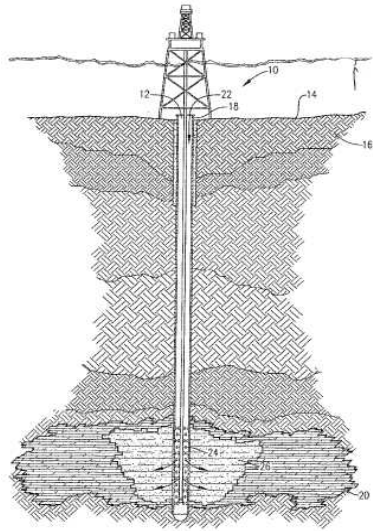
Methods for stimulating production {(by vibrating earth formations [E21B 43/003](#))}

Definition statement

This place covers:

Treatment of production wells to increase production of hydrocarbons, typically hydraulic fracturing treatments and matrix treatments (acidizing).

Illustrative example of the subject matter classified in this place:



References

Limiting references

This place does not cover:

Methods for stimulating production by vibrating earth formations	E21B 43/003
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Mixing of treatment fluids	E21B 21/062
Dump bailers	E21B 27/02
Vibration generating arrangements	E21B 28/00
Compositions for stimulating production in drilling boreholes or wells by acting on the underground formation	C09K 8/60

E21B 43/26

by forming crevices or fractures

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Mixing of fracturing fluids	E21B 21/062
Interconnecting wells by fracturing	E21B 43/17
Combustion in-situ in association with fracturing	E21B 43/247
Dissolving minerals in association with fracturing	E21B 43/283
Chemical compositions for forming crevices or fractures	C09K 8/62

E21B 43/263**using explosives****References*****Informative references****Attention is drawn to the following places, which may be of interest for search:*

Combustion in situ using explosives	E21B 43/248
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E21B 43/2635**{by means of nuclear energy}****References*****Informative references****Attention is drawn to the following places, which may be of interest for search:*

Peaceful applications of nuclear explosive devices in general	G21J 3/00
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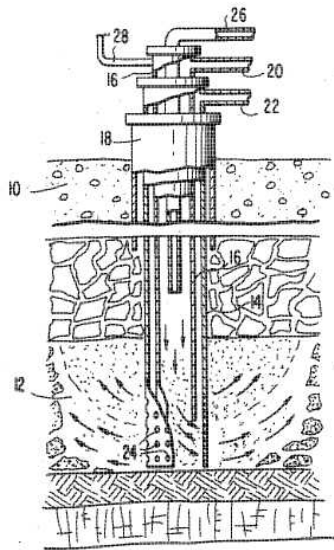
E21B 43/267**reinforcing fractures by propping****References*****Informative references****Attention is drawn to the following places, which may be of interest for search:*

Chemical compositions for reinforcing fractures by propping	C09K 8/80
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E21B 43/28**Dissolving minerals other than hydrocarbons, e.g. by an alkaline or acid leaching agent ([E21B 43/241](#) takes precedence)****Definition statement***This place covers:*

Production of minerals other than hydrocarbons by dissolving them in situ with a dissolving agent.

Illustrative example of subject matter classified in this place:



References

Limiting references

This place does not cover:

Enhanced recovery methods for obtaining hydrocarbons using heat combined with solution mining of non-hydrocarbon minerals	E21B 43/241
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Methods or apparatus for cleaning boreholes or wells using chemical means for removing paraffins and other substances from the wellbore	E21B 37/06
Methods or apparatus for cleaning boreholes or wells using steerable or laterally extendable nozzles	E21B 43/292

E21B 43/281

{using heat}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

heating, cooling or insulating wells	E21B 36/00
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E21B 43/283**{in association with a fracturing process}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Fracturing per se	E21B 43/26
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E21B 43/285**Melting minerals, e.g. sulfur ([E21B 43/24](#) takes precedence)****References****Limiting references***This place does not cover:*

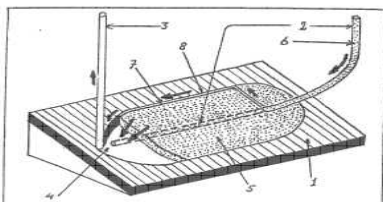
Enhanced recovery methods for obtaining hydrocarbons using heat, e.g. steam injection	E21B 43/24
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Informative references*Attention is drawn to the following places, which may be of interest for search:*

Heating, cooling or insulating arrangements for wells	E21B 36/00
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E21B 43/295**Gasification of minerals, e.g. for producing mixtures of combustible gases ([E21B 43/243](#) takes precedence)****Definition statement***This place covers:*

Obtention of combustible gas from mineral bodies, usually from coal underground.

**References****Limiting references***This place does not cover:*

Enhanced recovery methods for obtaining hydrocarbons using heat, the combustion being in situ	E21B 43/243
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Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Coal underground	A method for exploiting poor-quality mineral and thin seams by burning the mineral in place to produce combustible gas which can be burned to generate power or processed into chemicals and fuels
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E21B 43/30

Specific pattern of wells, e.g. optimising the spacing of wells

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Production satellite stations for obtaining oil, gas, water, soluble or meltable materials or a slurry of minerals from underwater installations	E21B 43/017
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E21B 43/34

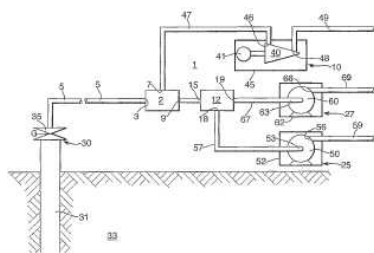
Arrangements for separating materials produced by the well

Definition statement

This place covers:

Separation of materials produced by the well.

Illustrative example of subject matter classified in this place:



E21B 44/00

Automatic control systems specially adapted for drilling operations, i.e. self-operating systems which function to carry out or modify a drilling operation without intervention of a human operator, e.g. computer-controlled drilling systems; Systems specially adapted for monitoring a plurality of drilling variables or conditions

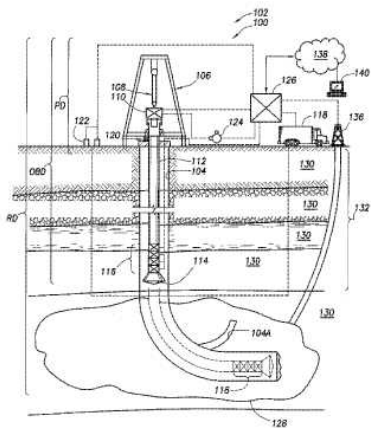
Definition statement

This place covers:

Methods and devices such as sensors for monitoring drilling operations and for controlling the drilling operation in response to the information obtained.

Definition statement

Illustrative example of the subject matter classified in this place:



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Automatic feeding from rack and connecting of drilling pipes	E21B 19/20
Controlling pressure or flow of drilling fluid	E21B 21/08
Control systems in general	G05
Adaptive control systems	G05B 13/00

E21B 44/10

Arrangements for automatic stopping when the tool is lifted from the working face

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Arrangements for automatic stopping for portable percussive tools	B25D 9/265
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E21B 45/00

Measuring the drilling time or rate of penetration

Special rules of classification

Drilling time or rate of penetration measurements should only be classified in [E21B 45/00](#) if specific measurement techniques are disclosed, or if the drilling time or rate of penetration data is relevant for the execution of another operation.

E21B 47/00

Survey of boreholes or wells (monitoring pressure or flow of drilling fluid E21B 21/08)

Definition statement

This place covers:

Specific applications in a downhole environment, including:

- Sensors or devices for obtaining data relative to the wellbore itself.
- Means for sending information from the well to the surface or from the surface into the well.

Relationships with other classification places

[E21B 47/00](#) includes a wide range of measurements of very different nature. In case the disclosure relates to the specific construction or functioning of a sensor or measuring method, classification in one of the subclasses of [G01](#) as specified in the subgroups should be considered.

Measurements of fluid properties as they flow into the wellbore are classified in [E21B 47/10](#), but devices and methods for obtaining fluid samples are classified in [E21B 49/08](#).

Telecommunication techniques used in an oilfield but other than between wellbore and surface, such as to communicate data from a plurality of producing wells to a centralised location, should not be classified in [E21B 47/12](#), but in the corresponding group relative to its specific application, in this example oil production, if they have an influence in the operation of the production control. If a document mentions only the application to an oilfield or the like, and no specific application in an oilfield operation, but only the details of a communications system are disclosed, that document should be classified in [H04L](#).

References

Limiting references

This place does not cover:

Monitoring pressure or flow of drilling fluid	E21B 21/08
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Testing of formations and obtaining samples of fluids or of borehole walls	E21B 49/00
Geophysical logging	G01V
Details, e.g. power supply systems for well logging instruments	G01V 11/002

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

borehole	an unlined shaft drilled into the ground, typically for the purposes of extracting water, crude oil or natural gas. This is often referred to as the wellbore.
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E21B 47/002**by visual inspection****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Photographing internal surfaces, e.g. of pipes	G03B 37/005
Closed circuit television systems	H04N 7/18

E21B 47/003**Determining well or borehole volumes****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Measuring depth or liquid level of boreholes or wells	E21B 47/04
Measuring diameter or related dimensions at the borehole	E21B 47/08
Measuring volumes in general	G01F

E21B 47/005**Monitoring or checking of cementation quality or level****Definition statement***This place covers:*

Processes or apparatus for tracking or examining the extent or integrity of the plugging or consolidating material.

References**Informative references***Attention is drawn to the following places, which may be of interest for search:*

Measuring temperature at borehole or well	E21B 47/07
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E21B 47/007**Measuring stresses in a pipe string or casing (for locating blocked portions of pipes [E21B 47/09](#))****Definition statement***This place covers:*

Processes or apparatus for determining the tensile or compressive force per cross-sectional area acting upon a pipe string or casing.

References

Limiting references

This place does not cover:

Locating blocked portions of pipes	E21B 47/09
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Measuring stress in general	G01L
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E21B 47/01

Devices for supporting measuring instruments on drill bits, pipes, rods or wirelines; Protecting measuring instruments in boreholes against heat, shock, pressure or the like

Definition statement

This place covers:

Devices for mounting a data collection instrument upon a boring tool, boring tool string or cable-carried tool. Devices for shielding down-hole data collection instruments from damage.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Flexible or expansible centering means per se	E21B 17/1014
Setting or locking tools in boreholes or wells	E21B 23/00

E21B 47/017

Protecting measuring instruments

Definition statement

This place covers:

Processes or apparatus for shielding the data collection device against thermal effect, vibration, pressure, debris or the like.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Cooling or insulating arrangements for boreholes or wells	E21B 36/00
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E21B 47/0175**{Cooling arrangements}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Cooling or insulating arrangements for boreholes or wells	E21B 36/00
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E21B 47/02**Determining slope or direction****Definition statement***This place covers:*

Processes or apparatus for measuring the inclination or orientation of boreholes or devices in boreholes or wells.

References**Informative references***Attention is drawn to the following places, which may be of interest for search:*

Clinometers or direction meters in general	G01C
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E21B 47/022**of the borehole, e.g. using geomagnetism****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Navigation, gyroscopic instruments	G01C
Geophysics, detecting masses or objects	G01V

E21B 47/0224**using seismic or acoustic means****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Seismic or acoustic prospecting	G01V 1/00
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E21B 47/0228

using electromagnetic energy or detectors therefor

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Magnetic or electric prospecting	G01V 3/00
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E21B 47/024

of devices in the borehole (determining slope or direction of the borehole
[E21B 47/022](#))

Definition statement

This place covers:

Processes or apparatus for measuring the inclination or orientation of down-hole tools.

References**Limiting references**

This place does not cover:

Determining slope or direction of the borehole	E21B 47/022
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E21B 47/026

of penetrated ground layers

Definition statement

This place covers:

Processes or apparatus for measuring the inclination, i.e. dip, or orientation, i.e. strike, of a drilled stratum, e.g. by using a specially adapted compass, e.g. a Brunton compass.

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Apparatus for obtaining oriented cores	E21B 25/16
Formation testing	E21B 49/00
Geophysics; Detecting Masses or Objects	G01V

E21B 47/04

Measuring depth or liquid level

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Measuring depth in general	G01B 7/26
Measuring liquid level in general and telerecorders for level of liquids	G01F

E21B 47/06

Measuring temperature or pressure

Definition statement

This place covers:

Measurements of temperature or pressure when specific measurement techniques are disclosed, or if the temperature or pressure data is relevant for the execution of another operation.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Measuring temperature in general; Telerecorders for temperature	G01K
Measuring pressure in general; Telerecorders for pressure	G01L

E21B 47/08

Measuring diameters or related dimensions at the borehole

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Measuring diameter in general	G01B
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E21B 47/09

Locating or determining the position of objects in boreholes or wells {, e.g. the position of an extending arm}; Identifying the free or blocked portions of pipes

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Measuring depth at borehole or well	E21B 47/04
Measuring borehole or well diameter	E21B 47/08

E21B 47/092**by detecting magnetic anomalies****Definition statement**

This place covers:

Processes or apparatus for determining the whereabouts or position of objects in a borehole or well using magnetic attraction/repulsion force irregularities.

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Investigating materials by investigating magnetic variables	G01N 27/72
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E21B 47/10**Locating fluid leaks, intrusions or movements****Definition statement**

This place covers:

Processes or apparatus for determining if the pipes are sufficiently fluid-tight to prevent leakage or ingress of liquid or gas.

Processes or apparatus for detecting unwanted fluids flowing from the formation into the borehole.

Processes or apparatus for detecting the presence and properties of production fluids in the borehole.

Processes or apparatus for determining well debit or flow rate.

Processes or apparatus for measuring or detecting flow of oil, water, or gas, or measuring properties (e.g. electrical) of fluids.

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Locating or determining the position of objects in boreholes or wells using impression packers	E21B 47/098
Flow measurement in general	G01F
Examining density and leaking in general	G01M

E21B 47/103

using thermal measurements

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Measuring temperature of boreholes or wells	E21B 47/07
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E21B 47/117

Detecting leaks, e.g. from tubing, by pressure testing

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Investigating fluid-tightness of structures by using fluid or vacuum	G01M 3/02
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E21B 47/12

Means for transmitting measuring-signals or control signals from the well to the surface, or from the surface to the well, e.g. for logging while drilling

Definition statement

This place covers:

Processes or apparatus in which an information or control signal is sent to or from equipment located in the borehole over an information transmission link.

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Remote signaling in general	G08C
Transmission of digital information, e.g. telegraphic communication	H04L

E21B 47/125

using earth as an electrical conductor (by electromagnetic energy [E21B 47/13](#))

Definition statement

This place covers:

Processes or apparatus in which the transmission link is through the ground.

References

Limiting references

This place does not cover:

Means for transmitting measuring-signals or control signals from the well to the surface, or from the surface to the well, e.g. for logging while drilling, by electromagnetic energy	E21B 47/13
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Magnetic or electric prospecting	G01V 3/00
Transmission systems in which the earth is the medium	H04B 13/02

E21B 47/13

by electromagnetic energy, e.g. radio frequency

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Magnetic or electric prospecting	G01V 3/00
Electronic transmission in general	H04B

E21B 47/135

using light waves, e.g. infrared or ultraviolet waves

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Light guides, e.g. optical fibres	G02B 6/00
Optical transmission in general	H04B 10/00

E21B 47/138

{Devices entrained in the flow of well-bore fluid for transmitting data, control or actuation signals}

Definition statement

This place covers:

Devices or carriers that are flowable with or through fluids in the well for performing measurements or for transmitting data, control or actuating signals.

E21B 47/26

Storing data down-hole, e.g. in a memory or on a record carrier

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Recording in connection with measuring in general	G01D
Recording seismic data	G01V 1/24
Recording data of measuring magnetic field characteristic of the earth	G01V 3/36
Information storage in general	G11

E21B 49/00

Testing the nature of borehole walls; Formation testing; Methods or apparatus for obtaining samples of soil or well fluids, specially adapted to earth drilling or wells

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Sampling in general	G01N 1/00
Geomodelling in general	G01V 20/00

E21B 49/005

{Testing the nature of borehole walls or the formation by using drilling mud or cutting data}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Investigating chemical or physical properties of materials per se	G01N
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E21B 49/006

{Measuring wall stresses in the borehole}

Definition statement

This place covers:

Measuring wall stresses in the borehole through in-situ measurements only.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Investigation of mechanical properties of foundation soil	E02D 1/022
Measuring stresses on core or rock samples	G01N 33/24

E21B 49/008

{by injection test; by analysing pressure variations in an injection or production test, e.g. for estimating the skin factor (measuring pressure [E21B 47/06](#))}

References

Limiting references

This place does not cover:

Measuring pressure of boreholes or wells	E21B 47/06
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Obtaining fluid samples or testing fluids	E21B 49/08
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E21B 49/02

by mechanically taking samples of the soil

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Apparatus for obtaining undisturbed cores	E21B 25/00
Investigation of foundation soil in situ	E02D 1/00

E21B 49/025

{of underwater soil, e.g. with grab devices}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Underwater coring	E21B 25/18
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E21B 49/04**using explosives in boreholes; using projectiles penetrating the wall****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Drilling by use of explosives	E21B 7/007
Gun or shaped charge perforators	E21B 43/116

E21B 49/08**Obtaining fluid samples or testing fluids, in boreholes or wells****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Packers	E21B 33/12
Valve arrangements for boreholes or wells	E21B 34/00
Analysing pressure variations in an injection or production test	E21B 49/008

E21B 49/0815**{Sampling valve actuated by tubing pressure changes}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Bailers	E21B 27/00
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E21B 49/0875**{determining specific fluid parameters}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Locating fluid leaks, intrusions or movements	E21B 47/10
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E21B 2200/20

Computer models or simulations, e.g. for reservoirs under production, drill bits

Special rules of classification

Subject matter classified here should include significant or specific details of modeling or simulating.

E21B 2200/22

Fuzzy logic, artificial intelligence, neural networks or the like

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Fuzzy logic, artificial intelligence, neural networks per se	G06N
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Special rules of classification

Subject matter classified here should include significant/specific details of fuzzy logic, artificial intelligence, neural networks, or the like.