

## 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	<a href="#">E21C</a>
Making shafts, driving galleries or tunnels	<a href="#">E21D</a>

## E21B 1/00

### Percussion drilling

#### Definition statement

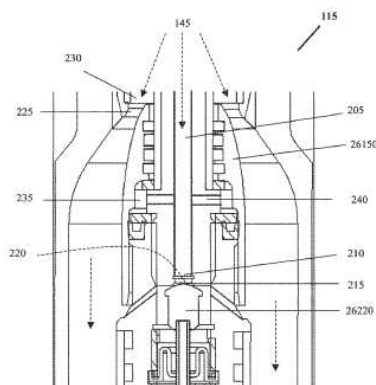
*This place covers:*

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

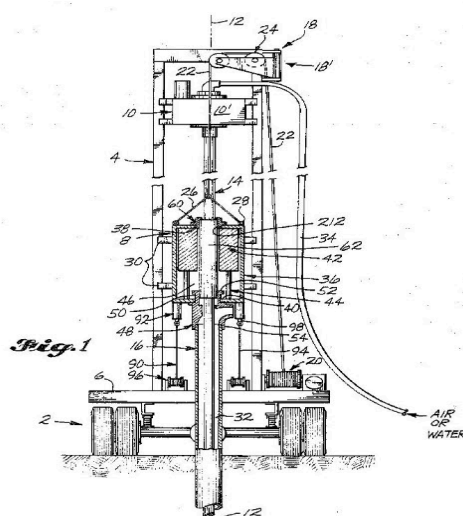
The percussive drive is placed outside of the borehole, and the drilling can be for any depth, including drillholes and mining applications.

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	<a href="#">E21B 4/00</a>
Drives for combined percussion and rotary drilling	<a href="#">E21B 6/00</a>
Portable drilling rigs	<a href="#">E21B 7/20</a>
Derricks, masts	<a href="#">E21B 15/00</a>
Rotary drilling machines in general	<a href="#">B23B</a>

## E21B 3/00

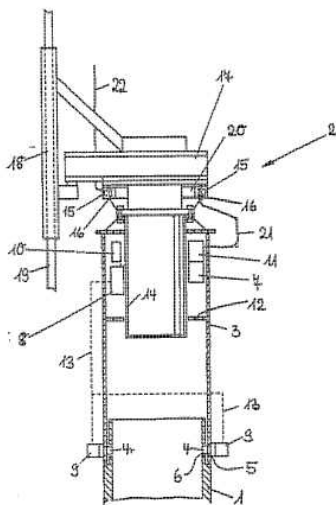
### Rotary drilling

#### 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	<a href="#">E21B 4/00</a>
Drives for combined percussion and rotary drilling	<a href="#">E21B 6/00</a>
Portable drilling rigs	<a href="#">E21B 7/20</a>
Derricks, masts	<a href="#">E21B 15/00</a>
Rotary drilling machines in general	<a href="#">B23B</a>

## 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	<a href="#">E21B 7/021</a>
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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	<a href="#">E21B 15/003</a>
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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	<a href="#">E21B 15/02</a>
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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	<a href="#">E21B 19/16</a>
Rope, cable or chain winding mechanisms; Capstans	<a href="#">B66D 1/00</a>

## E21B 4/00

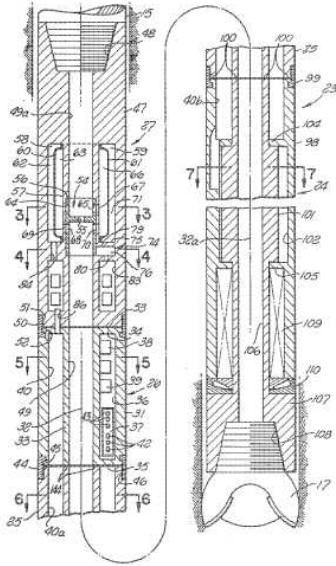
Drives for drilling, used in the borehole

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

## 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	<a href="#">E21B 10/22</a>
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**Informative references**

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

Bearings in general	<a href="#">F16C</a>
Sealing in general	<a href="#">F16J</a>
Lubricating in general	<a href="#">F16N</a>

**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	<a href="#">E21B 4/10</a>
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**Informative references**

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

Gearings in general	<a href="#">F16H</a>
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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	<a href="#">F03B 13/02</a>
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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	<a href="#">E21B 11/02</a>
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**Informative references**

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

Percussion drill bits	<a href="#">E21B 10/36</a>
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Releasing-jars	<a href="#">E21B 31/107</a>
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## E21B 6/00

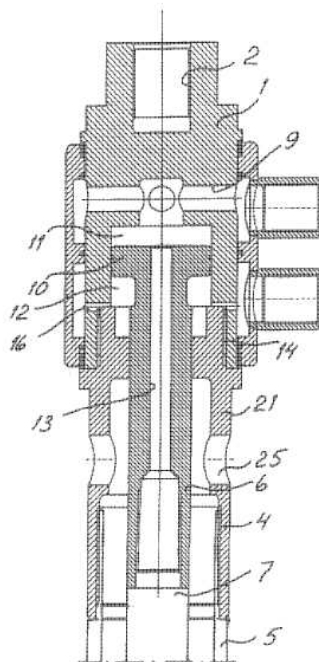
### Drives for drilling with combined rotary and percussive action

#### 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	<a href="#">E21B 4/00</a>
Portable drilling rigs	<a href="#">E21B 7/20</a>
Derricks, masts	<a href="#">E21B 15/00</a>
Methods or apparatus for generating mechanical vibrations of infrasonic, sonic or ultrasonic frequency	<a href="#">B06B 1/00</a>
Portable percussive machines with superimposed rotation	<a href="#">B25D 16/00</a>

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

## 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	<a href="#">E21B 7/001</a>
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##### Informative references

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

Plural down-hole drives	<a href="#">E21B 4/16</a>
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Simultaneously drilling and casing	<a href="#">E21B 7/20</a>
Pipes with plural fluid passages	<a href="#">E21B 17/18</a>

## 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	<a href="#">E21B 11/04</a>
Containers for collecting material in boreholes	<a href="#">E21B 27/00</a>
Tunneling	<a href="#">E21D</a>

## 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	<a href="#">E21B 27/04</a>
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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	<a href="#">E21B 7/1245</a>
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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	<a href="#">E21B 23/04</a> , <a href="#">E21B 23/065</a>
Cutting or destroying objects in boreholes by explosives	<a href="#">E21B 29/02</a>
Freeing objects using explosives	<a href="#">E21B 31/1075</a>



Gun or shaped-charge perforators	<a href="#">E21B 43/116</a>
Fracturing by explosives	<a href="#">E21B 43/263</a> , <a href="#">E21B 43/248</a>
Taking samples using explosives	<a href="#">E21B 49/04</a>

## 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	<a href="#">A01K 97/01</a>
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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	<a href="#">E21B 7/124</a>
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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	<a href="#">E21B 3/04</a>
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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	<a href="#">E02F 9/028</a>
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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	<a href="#">E21D 20/003</a>
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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	<a href="#">E21B 11/005</a>
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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	<a href="#">E21B 15/04</a>
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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	<a href="#">E21B 29/06</a>
Deflecting the direction of fishing tools	<a href="#">E21B 31/14</a>

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

*This place does not cover:*

Underwater drilling using heave compensators	<a href="#">E21B 19/09</a>
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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	<a href="#">E21B 15/02</a>
Telescoping joints	<a href="#">E21B 17/07</a>
Well heads specially adapted for underwater installations	<a href="#">E21B 33/035</a>
Submerged foundations	<a href="#">E02D 27/52</a>

**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	<a href="#">E21B 41/10</a>
Floating drilling platforms	<a href="#">B63B 35/44</a>

## 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	<a href="#">E21B 7/007</a>
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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	<a href="#">E21B 7/14</a>
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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	<a href="#">E21B 43/29</a>
Hydraulic monitors	<a href="#">E21C 45/00</a>

## 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	<a href="#">E21B 3/025</a>
Drilling with multiple driven shafts	<a href="#">E21B 7/002</a>
Pushing means outside of the borehole	<a href="#">E21B 19/08</a>
Placing piles	<a href="#">E02D 7/00</a>
Sinking shafts while moving the lining downwards	<a href="#">E21D 1/08</a>
Making galleries by forcing prefabricated elements through the ground	<a href="#">E21D 9/005</a>

## 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	<a href="#">E21B 7/005</a>
Augers	<a href="#">E21B 10/44</a>
Drilling rods or pipes with helical structure	<a href="#">E21B 17/22</a>

## 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	<a href="#">E21B 4/00</a>
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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	<a href="#">E21B 4/00</a>
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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	<a href="#">E21B 7/203</a>
Using down-hole drives without earth removal	<a href="#">E21B 7/206</a>

**Informative references**

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

Using down-hole drives per se	<a href="#">E21B 4/00</a>
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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	<a href="#">E21B 7/30</a>
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**Informative references**

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

Down-hole drives	<a href="#">E21B 4/00</a>
Fluid operated of the self propelled-type	<a href="#">E21B 4/145</a>

**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

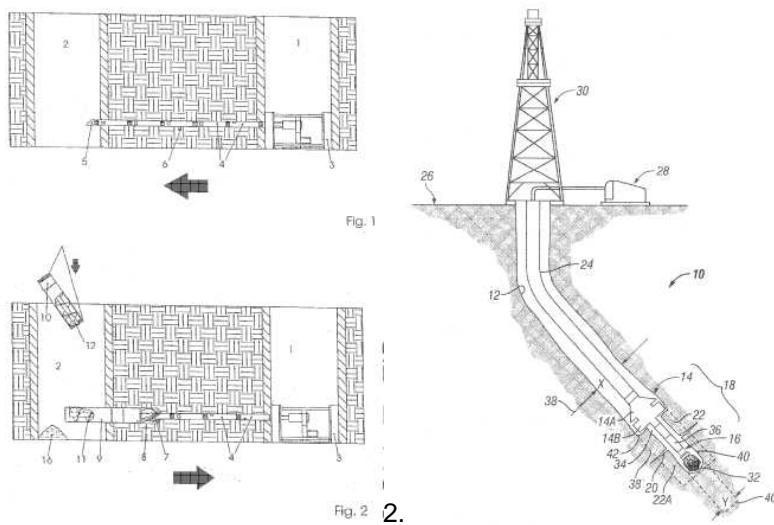
#### Definition statement

*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	<a href="#">E21B 10/26</a>
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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	<a href="#">E21B 7/064</a>
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Drill bits with means for collecting substances	<a href="#">E21B 27/00</a>
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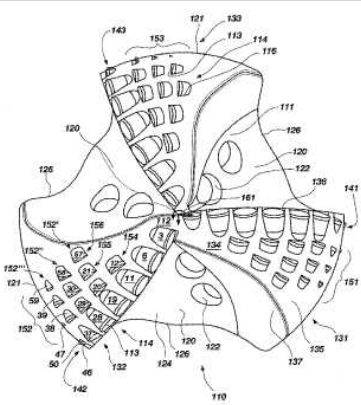
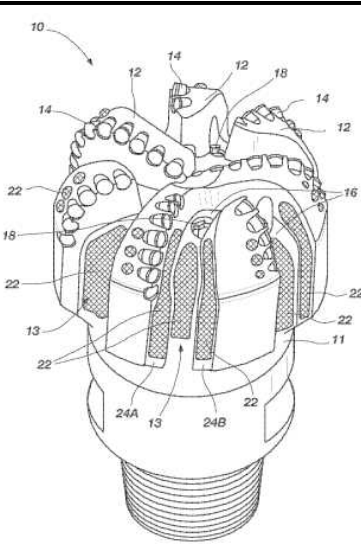
**Informative references**

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

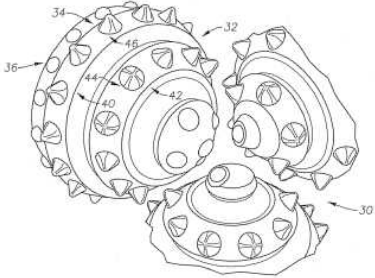
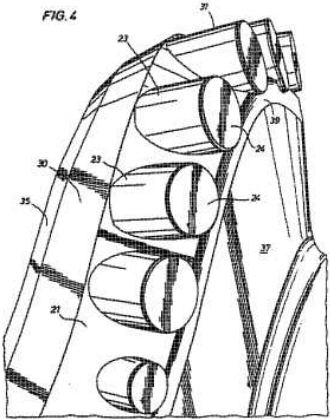
Manufacture of articles from metal powder	<a href="#">B22F</a>
Special treatment of metallic powder, e.g. to facilitate working, to improve properties	<a href="#">B22F 1/00</a>
Cutting tools of which the bits or tips are of special material	<a href="#">B23B 27/14</a>
Drill bits for stone or stone-like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

**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	<a href="#">E21B 10/48</a>
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#### Informative references

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

Obtaining undisturbed cores	<a href="#">E21B 25/00</a>
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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	<a href="#">E21B 10/12</a>
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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	<a href="#">E21B 10/23</a>
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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	<a href="#">E21B 10/10</a>
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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	<a href="#">F16C</a>
Lubricating in general	<a href="#">F16N</a>

**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	<a href="#">E21B 10/40</a>
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**Informative references**

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

Enlarging boreholes in general	<a href="#">E21B 7/28</a>
Augers with leading portion	<a href="#">E21B 10/44</a>

Turning or boring with stone, rock or concrete as tool or workpiece material	<a href="#">B23B 2226/75</a>
Tools for working stone or stone-like materials by boring or drilling	<a href="#">B28D 1/146</a>

## 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	<a href="#">E21B 10/42</a>
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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	<a href="#">E21B 17/22</a>
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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	<a href="#">E21B 10/36</a>
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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	<a href="#">E21B 10/006</a>
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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	<a href="#">B28D 1/041</a>
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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	<a href="#">E21B 10/56</a> , <a href="#">E21B 10/58</a>
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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	<a href="#">B22F</a>
Metal-working not otherwise provided for	<a href="#">B23P</a>
Alloys containing diamonds	<a href="#">C22C</a>

**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	<a href="#">B23B 27/143</a>
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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	<a href="#">E21B 10/485</a>
Drill bits characterised by wear resisting parts, the bit being of roller type with chisel- or button-type inserts	<a href="#">E21B 10/52</a>

#### 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	<a href="#">E21B 10/54</a>
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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	<a href="#">E21B 10/18</a>
Percussion drill bits characterised by conduits or nozzles for drilling fluids	<a href="#">E21B 10/38</a>

#### Informative references

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

Mining picks with arrangement of fluid-spraying nozzles	<a href="#">E21C 35/187</a>
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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	<a href="#">E21B 10/20</a>
Augers with leading portion or with detachable parts	<a href="#">E21B 10/44</a>

Drill bits characterised by the whole or part thereof being insertable into or removable from the borehole without withdrawing the drilling pipe	<a href="#">E21B 10/64</a>
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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	<a href="#">E21B 10/42</a>
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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	<a href="#">E21B 25/02</a>
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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	<a href="#">E21B 7/028</a>
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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	<a href="#">E21B 4/06</a>
Self-propelled fluid-operated hammers	<a href="#">E21B 4/145</a>
Burrowing devices	<a href="#">E21B 7/26</a>
Percussion drill bits	<a href="#">E21B 10/36</a>

## E21B 11/04

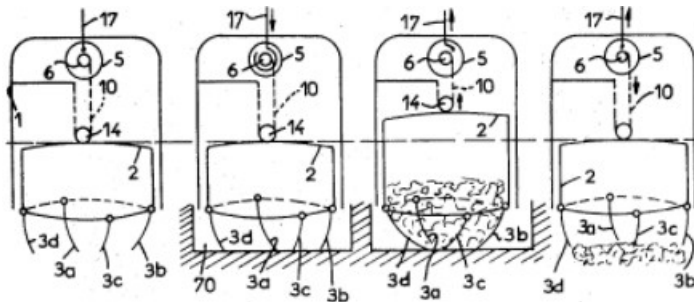
### Boring grabs

#### 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	<a href="#">E21C 25/22</a>
Slitting by unguided cutter cables or cutter chains, or by unguided tools drawn along the working face by cables or the like	<a href="#">E21C 25/54</a>
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	<a href="#">E21C 25/56</a>
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	<a href="#">E21C 27/04</a>

## 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	<a href="#">E21B 19/18</a>
Sharpening stone drill bits	<a href="#">B24B 3/33</a>

## 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	<a href="#">G01N 3/56</a>
Investigating machinability by cutting tools; Investigating the cutting ability of tools	<a href="#">G01N 3/58</a>

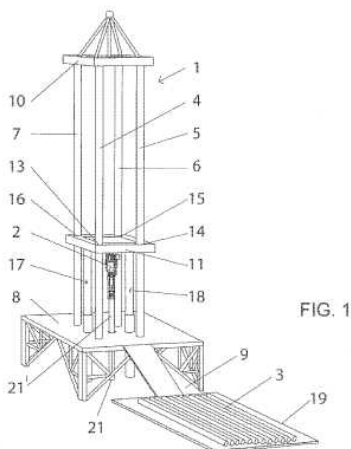
## E21B 15/00

### 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	<a href="#">E21B 7/02</a>
Floating drilling platforms	<a href="#">B63B 35/44</a>
Drilling platforms on legs	<a href="#">E02B 17/00</a>

## 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	<a href="#">E21B 15/04</a>
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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	<a href="#">E21B 15/04</a>
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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	<a href="#">E21B 15/003</a>
Floating drilling platforms	<a href="#">B63B 35/44</a>
Drilling platforms on legs	<a href="#">E02B 17/00</a>

**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	<a href="#">E21B 15/003</a>
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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	<a href="#">E21B 43/0107</a>
Connecting flow lines to an underwater wellhead	<a href="#">E21B 43/013</a>
Expansible tubulars	<a href="#">E21B 43/103</a>
Details of, or accessories for, portable power-driven percussive tools	<a href="#">B25D 17/00</a>
Rod couplings in general	<a href="#">F16D</a>
Tubes or tube couplings in general	<a href="#">F16L</a>
Repairing or joining pipes on or under water, e.g. subsea flow lines	<a href="#">F16L 1/00</a>
Pipe-line systems	<a href="#">F17D 1/00</a>

**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	<a href="#">E21B 17/023</a>
Electrical or electro-magnetic connections	<a href="#">E21B 17/028</a>

**Informative references**

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

Pipe joints specially adapted for electrically insulating the two pipe ends of the joint from each other	<a href="#">F16L 25/02</a>
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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	<a href="#">E21B 19/004</a>
Riser connectors	<a href="#">E21B 33/038</a>

**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	<a href="#">E21B 19/16</a>
Fishing tools for frozen rods, casings, ropes, bits or the like	<a href="#">E21B 31/00</a>

**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	<a href="#">E21B 17/1035</a>
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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	<a href="#">E21B 17/06</a>
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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	<a href="#">E21B 21/02</a>
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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	<a href="#">E21B 43/116</a>
Dropping perforation guns after gun actuation	<a href="#">E21B 43/1193</a>

**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	<a href="#">E21B 19/09</a>
Releasing-jars	<a href="#">E21B 31/107</a>
Shock-absorbers in general	<a href="#">F16F</a>

**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	<a href="#">E21B 4/18</a>
Guiding or centralising devices outside the borehole	<a href="#">E21B 19/24</a>
Devices for positioning logging sondes with respect to the borehole wall	<a href="#">G01V 11/005</a>

**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	<a href="#">E21B 47/08</a>
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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	<a href="#">E21B 21/10</a>
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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	<a href="#">E21B 17/203</a>
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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	<a href="#">E21B 21/12</a>
Joints or fittings for double-walled or multi-channel pipes or pipe assemblies	<a href="#">F16L 39/00</a>

**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	<a href="#">E21B 17/01</a>
Swivel joints between rod or the like and bit or between rod and rod or the like	<a href="#">E21B 17/05</a>

**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	<a href="#">F16L 11/127</a>
Flexible electrical cables in boreholes	<a href="#">H01B 7/046</a>

**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	<a href="#">E21B 10/44</a>
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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	<a href="#">E21B 1/02</a> , <a href="#">E21B 3/02</a>
Manipulators mounted on wheels or on carriages	<a href="#">B25J 5/00</a>
Gripping heads	<a href="#">B25J 15/00</a>

## E21B 19/002

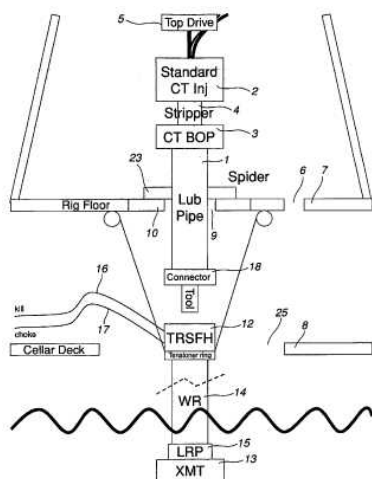
{specially adapted for underwater drilling ([E21B 19/09](#), [E21B 19/143](#) take precedence)}

### 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	<a href="#">E21B 19/09</a>
Racks, ramps, troughs or bins, for holding the lengths of rod singly or connected, specially adapted for drilling	<a href="#">E21B 19/143</a>

### Informative references

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

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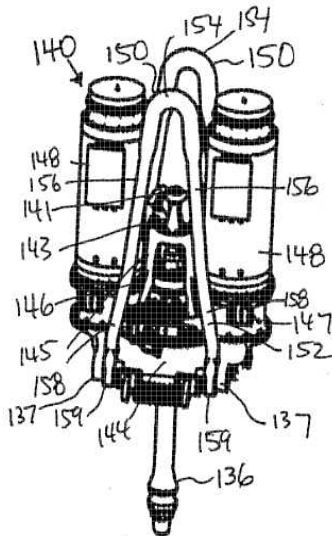
**E21B 19/008****{Winding units, specially adapted for drilling operations}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Cathead actuated pipe wrenches or spinners	<a href="#">E21B 19/162</a>
Capstans, winches	<a href="#">B66D</a>

**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	<a href="#">B66C 1/00</a>
Tackles, e.g. pulley blocks or crown blocks	<a href="#">B66D</a>
Cable guides	<a href="#">B66D 1/36</a>



## 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	<a href="#">E21B 19/10</a>
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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

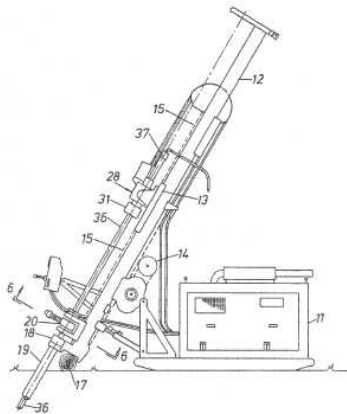
*This place covers:*

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	<a href="#">E21B 19/22</a>
Automatic control of the tool feed	<a href="#">E21B 44/02</a>

**Informative references**

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

Hoisting drums	<a href="#">B66D</a>
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**E21B 19/09**

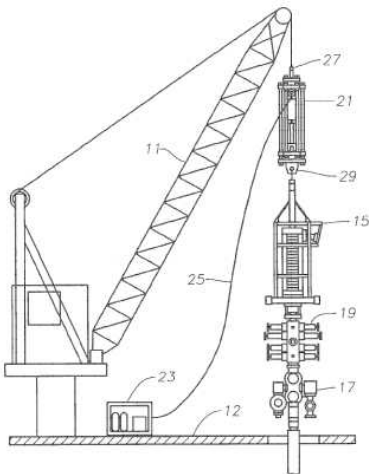
**specifically adapted for drilling underwater formations from a floating support using heave compensators supporting the drill string**

**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	<a href="#">E21B 17/07</a>
Heave compensators for supporting a riser	<a href="#">E21B 19/006</a>

**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	<a href="#">E21B 3/04</a>
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**Informative references**

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

Slip-type elevators	<a href="#">E21B 19/07</a>
Casing heads with slips	<a href="#">E21B 33/0422</a>

**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	<a href="#">F16G 11/00</a>
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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	<a href="#">E21B 19/20</a>
Handling reeled pipe or rod units	<a href="#">E21B 19/22</a>

**Informative references**

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

Storing elongated articles in general	<a href="#">B65G 1/0442</a>
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**E21B 19/16**

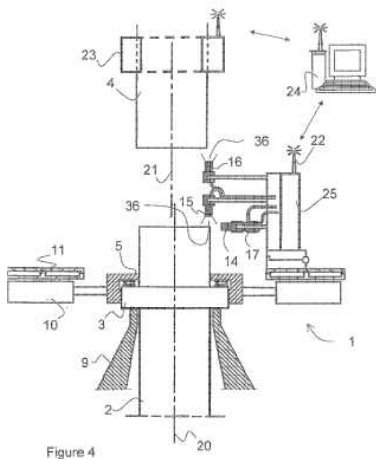
**Connecting or disconnecting pipe couplings or joints ([E21B 19/20](#) takes precedence)**

**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	<a href="#">E21B 19/20</a>
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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	<a href="#">B25B</a>
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## E21B 19/162

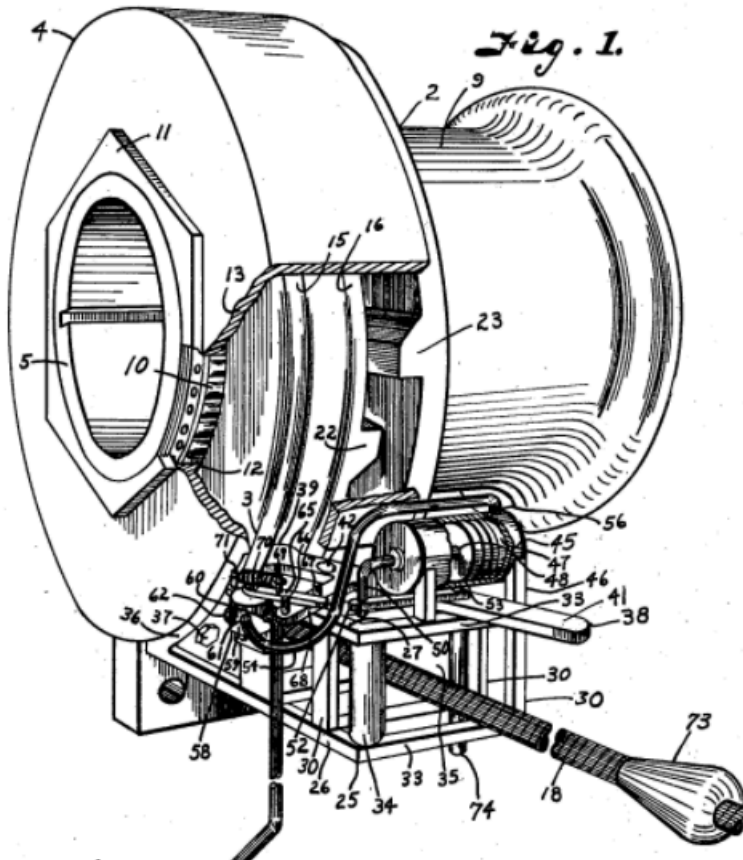
{cathead actuated}

### 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

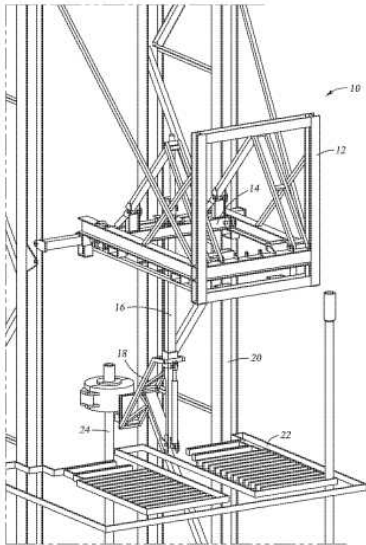
Combined feeding from rack and connecting, e.g. automatically

### 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	<a href="#">E21B 31/03</a>
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##### Informative references

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

Cementing	<a href="#">E21B 33/13</a>
Enhanced recovery methods	<a href="#">E21B 43/16</a>
Fracturing formations	<a href="#">E21B 43/26</a>

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

## 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	<a href="#">E21B 21/02</a>
Arrangements for treating drilling fluids	<a href="#">E21B 21/06</a>
Waste disposal systems	<a href="#">E21B 41/005</a>

## 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	<a href="#">E21B 21/10</a>
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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	<a href="#">F16L 31/00</a> , <a href="#">F16L 33/00</a>
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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	<a href="#">C09K 3/32</a>
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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	<a href="#">E21B 21/019</a>
Valves in general	<a href="#">F16K</a>



## 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	<a href="#">E21B 21/019</a>
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#### Informative references

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

Cementing valves	<a href="#">E21B 33/14</a>
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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	<a href="#">E21B 17/18</a>
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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	<a href="#">E21B 21/14</a>
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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	<a href="#">E21B 21/01</a>
Arrangements for treating drilling fluids	<a href="#">E21B 21/06</a>

## 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	<a href="#">E21B 43/10</a>
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#### Informative references

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

Borehole thrusters	<a href="#">E21B 4/18</a> , <a href="#">E21B 44/005</a>
Fishing for or freeing objects in boreholes or wells	<a href="#">E21B 31/00</a>

### 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	<a href="#">E21B 4/145</a>
Burrowing devices	<a href="#">E21B 7/26</a>
Self-contained pigs	<a href="#">F16L 55/32</a>

**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	<a href="#">E21B 4/18</a>
Apparatus for locking the tools or the like in landing nipples or in recesses between adjacent sections of tubing	<a href="#">E21B 23/02</a>
Apparatus for setting the tools into, or removing the tools from, laterally offset landing nipples or pockets	<a href="#">E21B 23/03</a>
Apparatus operated by fluid means	<a href="#">E21B 23/04</a>
Apparatus for setting packers	<a href="#">E21B 23/06</a>

**Informative references**

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

Packers	<a href="#">E21B 33/12</a>
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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	<a href="#">E21B 23/04</a>
Setting means incorporated into packers	<a href="#">E21B 33/10</a>

**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	<a href="#">E21B 23/12</a>
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Special provisions on heads for introducing objects or fluids into, or removing objects from, wells	<a href="#">E21B 33/068</a>
Cementing plugs	<a href="#">E21B 33/16</a>
Scrapers operated by fluid pressure	<a href="#">E21B 37/04</a>

## 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	<a href="#">E21B 7/06</a>
Tool diverters for setting the tools into, or removing the tools from, laterally offset landing nipples or pockets	<a href="#">E21B 23/03</a>

## 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	<a href="#">E21B 17/025</a>
Control line protectors for plural rods, pipes or lines	<a href="#">E21B 17/1035</a>
Surface apparatus for feeding cables	<a href="#">E21B 19/08</a>
Introducing or running tools by fluid pressure, e.g. through-the-flow-line tool systems	<a href="#">E21B 23/08</a>
Provision on well heads for introducing or removing cable-operated tools	<a href="#">E21B 33/072</a> , <a href="#">E21B 33/076</a>

## E21B 25/00

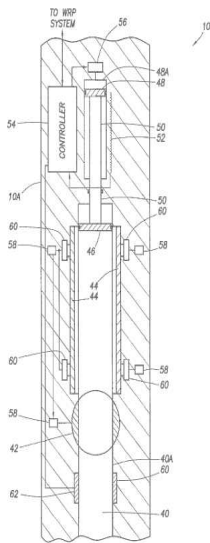
### Apparatus for obtaining or removing undisturbed cores, e.g. core barrels or core extractors (core bits [E21B 10/02](#))

#### 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	<a href="#">E21B 10/02</a>
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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	<a href="#">E21B 49/04</a>
Side-wall sampling or coring	<a href="#">E21B 49/06</a>

**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	<a href="#">G01N</a>
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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	<a href="#">E21B 10/64</a>
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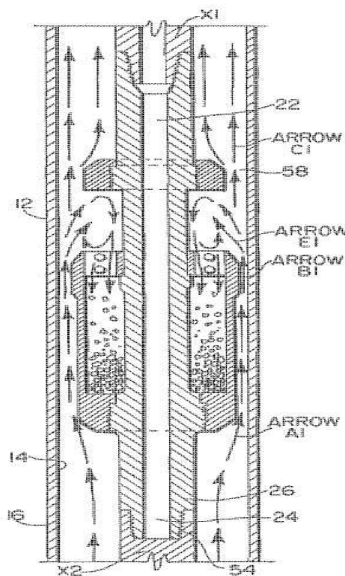
## E21B 27/00

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	<a href="#">E21B 31/08</a>
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**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	<a href="#">E21B 7/006</a>
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**E21B 28/00**

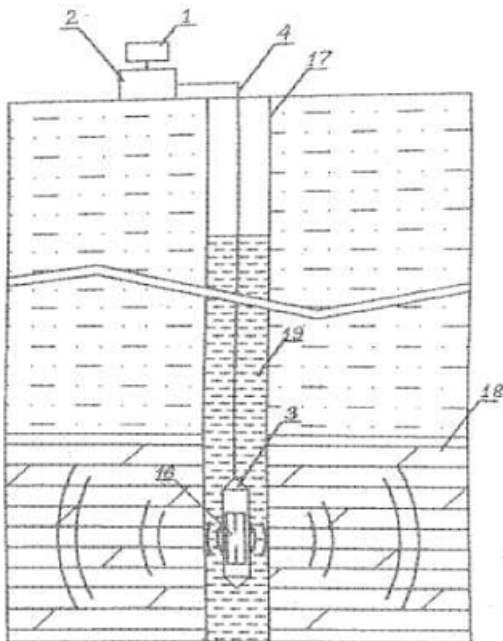
Vibration generating arrangements for boreholes or wells, e.g. for stimulating production (for fishing for or freeing objects [E21B 31/005](#);) for transmitting measuring-signals [E21B 47/14](#); for geophysical measurements [G01V 1/02](#))

**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	<a href="#">E21B 31/005</a>
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## 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	<a href="#">E21B 47/14</a>
Generating seismic energy for geophysical measurements	<a href="#">G01V 1/02</a>

**Informative references**

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

Vibration for drilling	<a href="#">E21B 7/24</a>
Vibrating earth formations	<a href="#">E21B 43/003</a>
Generating vibrations in general	<a href="#">B06B</a>

**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	<a href="#">E21B 7/28</a>
Shear-type blow-out preventers	<a href="#">E21B 33/063</a>
Expanding tubulars	<a href="#">E21B 43/103</a>
Perforators	<a href="#">E21B 43/11</a>

**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	<a href="#">E21B 31/002</a>
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**Informative references**

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

Destroying objects in boreholes or wells by explosives	<a href="#">E21B 31/16</a>
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**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	<a href="#">E21B 29/005</a>
Cutting or deforming pipes to control fluid flow	<a href="#">E21B 29/08</a>

**Informative references**

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

Whipstocks	<a href="#">E21B 7/061</a>
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**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	<a href="#">E21B 33/06</a>
Shear type blow-out preventers	<a href="#">E21B 33/063</a>

**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	<a href="#">E21B 7/28</a>
Expanding tools for setting expansible casings, liners, screens or the like	<a href="#">E21B 43/105</a>

**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	<a href="#">E21B 33/068</a>
Locating or determining the position of objects in boreholes or wells	<a href="#">E21B 47/09</a>

**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	<a href="#">E21B 29/02</a>
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**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	<a href="#">E21B 28/00</a>
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**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	<a href="#">C09K 2208/02</a>
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**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	<a href="#">E21B 4/06</a>
Telescoping joints	<a href="#">E21B 17/07</a>

**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	<a href="#">E21B 7/06</a>
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**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	<a href="#">E21B 29/00</a>
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**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	<a href="#">B23Q 7/043</a>
Gripping heads, Manipulators in general	<a href="#">B25J 15/00</a>
Gripping members for cranes	<a href="#">B66C 1/42</a>

## 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	<a href="#">B28C 5/00</a>
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#### Special rules of classification

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

## E21B 33/02

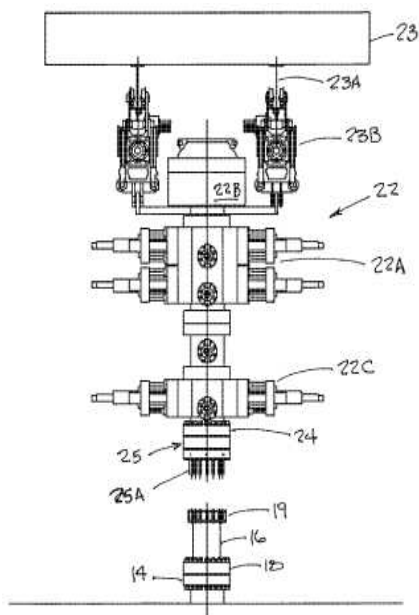
### Surface sealing or packing

#### 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	<a href="#">E21B 34/02</a>
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**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	<a href="#">C23F</a>
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**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	<a href="#">E21B 43/013</a>
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**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	<a href="#">H01R 13/523</a>
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**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	<a href="#">E21B 43/10</a>
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**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	<a href="#">E21B 19/10</a>
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**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	<a href="#">E21B 33/085</a>
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**Informative references***Attention is drawn to the following places, which may be of interest for search:*

Valve arrangements for boreholes or wells	<a href="#">E21B 34/00</a>
Control systems for blow-out preventers	<a href="#">E21B 34/16</a>

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

Cutting of wireline	<a href="#">E21B 29/04</a>
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**Informative references**

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

Cutting pipes	<a href="#">E21B 29/08</a>
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**E21B 33/064**

**specially 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	<a href="#">E21B 33/0355</a>
Connectors used on well heads, e.g. for connecting blow-out preventer and riser	<a href="#">E21B 33/038</a>

**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	<a href="#">E21B 33/05</a>
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**Informative references**

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

Wipers; Oil savers	<a href="#">E21B 33/08</a>
Launching or retrieval of pigs or moles	<a href="#">F16L 55/46</a>

**E21B 33/08**

**Wipers; Oil savers**

**Definition statement**

*This place covers:*

Wipers, oil savers and stuffing boxes.

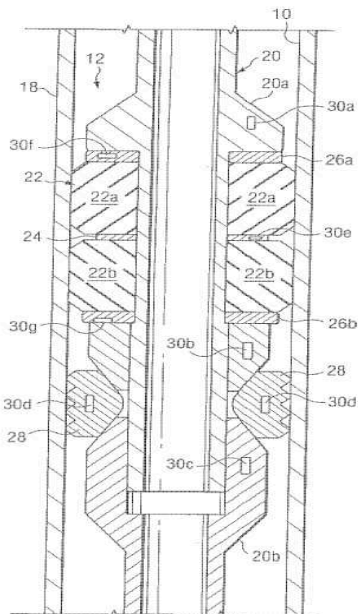
## E21B 33/12

### 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	<a href="#">E21B 33/134</a>
Using plugs for isolating cement charge	<a href="#">E21B 33/16</a>

##### 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	<a href="#">E21B 23/02</a>
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## 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	<a href="#">F16J 15/08</a>
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## 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	<a href="#">E21B 33/122</a>
Units with longitudinally-spaced plugs for isolating the intermediate space	<a href="#">E21B 33/124</a>

#### 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	<a href="#">E21B 33/1208</a>
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## E21B 33/13

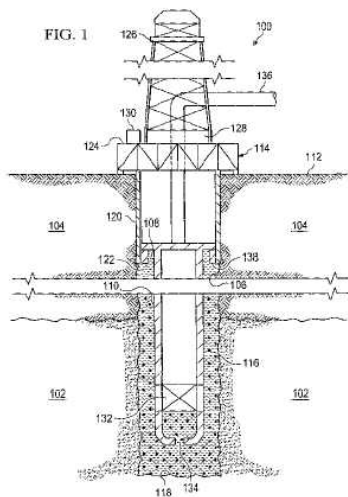
Methods or devices for cementing, for plugging holes, crevices or the like

### 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	<a href="#">E21B 27/02</a>
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Chemical compositions for cementing, plugging holes, crevices or the like	<a href="#">C09K 8/00</a>
Methods or apparatus for grouting offshore structures	<a href="#">E02B 17/0008</a>

## E21B 33/134

### Bridging plugs

#### References

##### *Informative references*

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

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

## 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	<a href="#">E21B 47/005</a>
Compositions for cementing	<a href="#">C09K 8/42</a>

## E21B 34/00

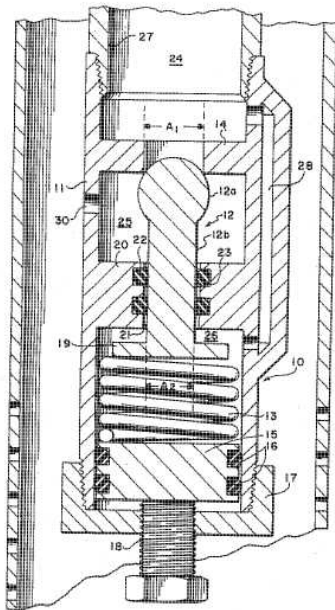
### Valve arrangements for boreholes or wells

#### 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	<a href="#">E21B 21/10</a>
Tool diverters	<a href="#">E21B 23/12</a>
Valve drill bits	<a href="#">E21B 27/00</a>
Blow-out preventers	<a href="#">E21B 33/06</a>
Oil flow regulating apparatus	<a href="#">E21B 43/12</a>
Gas lift valves	<a href="#">E21B 43/123</a>
Valves in general	<a href="#">F16K</a>

## 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	<a href="#">E21B 34/16</a>
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## 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	<a href="#">F15B 1/00</a>
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## 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	<a href="#">E21B 29/08</a>
Controlling flow of fluid to or in wells	<a href="#">E21B 43/12</a>
Fire fighting in general	<a href="#">A62C</a> , <a href="#">A62D</a>
Prevention of fires in mines or tunnels	<a href="#">E21F 5/00</a>

## E21B 36/00

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

### Definition statement

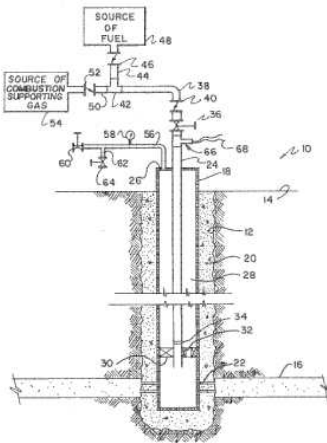
*This place covers:*

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	<a href="#">E21B 7/14</a>
Secondary recovery methods using heat	<a href="#">E21B 43/24</a>

**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	<a href="#">E21B 47/0175</a>
---	------------------------------

**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:

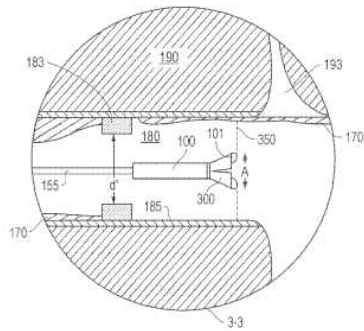


FIG. 3

**References**

**Limiting references**

*This place does not cover:*

Methods or apparatus for flushing boreholes, e.g. by use of exhaust air from motor	<a href="#">E21B 21/00</a>
--	----------------------------

**Informative references**

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

Bailers	<a href="#">E21B 27/00</a>
Inhibition of corrosion	<a href="#">E21B 41/02</a>
Cleaning pipes in general	<a href="#">B08B 9/02</a>

**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	<a href="#">E21B 23/08</a>
---	----------------------------

**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	<a href="#">C09K 8/52</a>
---	---------------------------

## 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	<a href="#">F16J 1/00</a>
--------------------	---------------------------

## 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	<a href="#">E21B 41/0021</a>
---	------------------------------

### Informative references

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

Slips, spiders	<a href="#">E21B 19/10</a>
----------------	----------------------------

## 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	<a href="#">F03B 13/00</a>
Fuel cells; Manufacture thereof	<a href="#">H01M 8/00</a>

## 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	<a href="#">E21B 23/12</a>
Cutting casing windows	<a href="#">E21B 29/06</a>

### *Informative references*

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

Whipstocks	<a href="#">E21B 7/061</a>
Specific well pattern	<a href="#">E21B 43/30</a>

## 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	<a href="#">E21B 43/0122</a>
Treating radioactively contaminated material; Decontamination arrangements therefor	<a href="#">G21F 9/00</a>



**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	<a href="#">G21F 9/24</a>
--	---------------------------

***Informative references***

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

Disposal of solid waste	<a href="#">B09B</a>
Reclamation of contaminated soil	<a href="#">B09C</a>
Storing fluid in natural or artificial cavities or chambers in the earth	<a href="#">B65G 5/00</a>
Storing fluid in porous layers	<a href="#">B65G 5/005</a>

**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	<a href="#">E21B 7/18</a>
Drill bits with nozzle	<a href="#">E21B 10/60</a>
Perforators using direct fluid action	<a href="#">E21B 43/114</a>
Obtaining a slurry of minerals using nozzles	<a href="#">E21B 43/29</a>

***Informative references***

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

Nozzles in general	<a href="#">B05B</a>
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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	<a href="#">H02</a>
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**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	<a href="#">E21B 27/02</a>
Compositions for in situ inhibition of corrosion in boreholes or wells	<a href="#">C09K 8/54</a>
Inhibiting corrosion in general	<a href="#">C23F</a>

**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	<a href="#">B25J</a>
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**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	<a href="#">B63C 11/00</a>
---	----------------------------

**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	<a href="#">E03B</a>
--	----------------------

**Informative references**

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

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

**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	<a href="#">E21B 28/00</a>
--	----------------------------

## 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	<a href="#">E21B 43/243</a>
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#### 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	<a href="#">E21F 7/00</a>
---	---------------------------

## E21B 43/01

especially adapted for obtaining from underwater installations

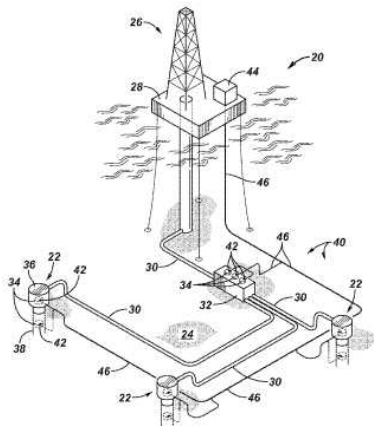
### Definition statement

*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	<a href="#">E21B 43/36</a>
------------------------------------	----------------------------

## E21B 43/02

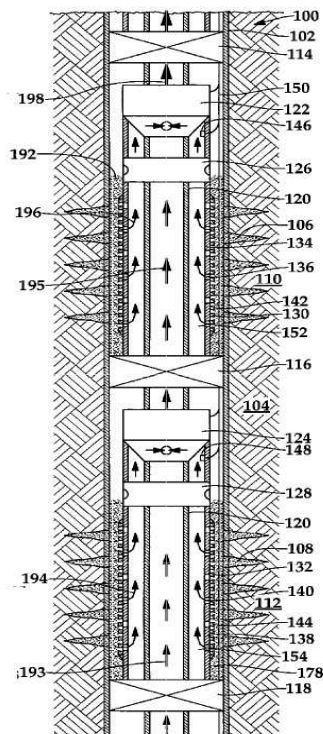
### Subsoil filtering

#### 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	<a href="#">E21B 43/11</a>
Chemical compositions for consolidating loose sand or the like around wells	<a href="#">C09K 8/56</a>

**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	<a href="#">E21B 33/138</a>
------------------------	-----------------------------

**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	<a href="#">E03B 3/24</a>
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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	<a href="#">E21B 43/108</a>
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**Informative references**

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

Separation, filters in general	<a href="#">B01D</a>
Obtaining drinking water using well filters	<a href="#">E03B 3/18</a>

**E21B 43/10**

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

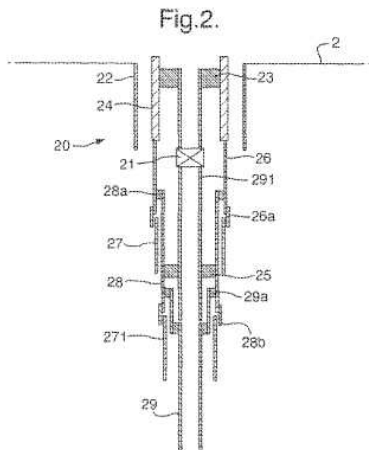
**Definition statement**

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	<a href="#">E21B 7/20</a>
Setting of tools, packers or the like	<a href="#">E21B 23/00</a>
Suspending casings in well heads	<a href="#">E21B 33/04</a>

**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	<a href="#">B21D 39/08</a>
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**E21B 43/11**

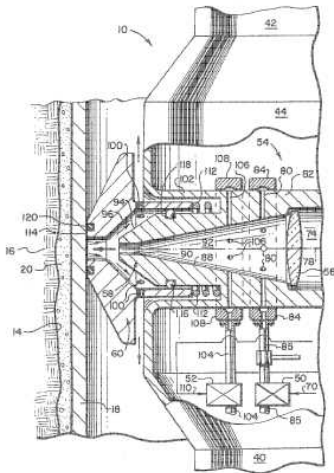
**Perforators; Permeators**

**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	<a href="#">F42B 12/10</a>
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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	<a href="#">E21B 17/06</a>
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## E21B 43/12

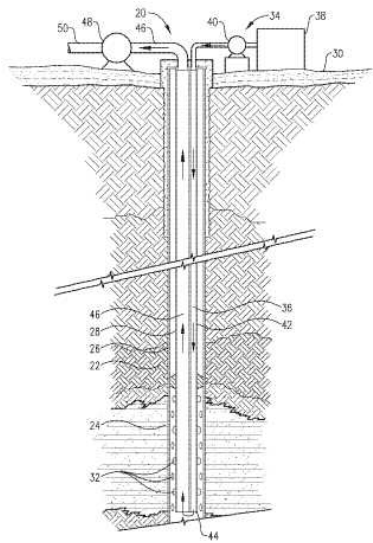
Methods or apparatus for controlling the flow of the obtained fluid to or in wells  
([E21B 43/25](#) takes precedence; valve arrangements [E21B 34/00](#))

### 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	<a href="#">E21B 34/00</a>
Methods for stimulating production	<a href="#">E21B 43/25</a>

## 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	<a href="#">E21B 47/008</a>
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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	<a href="#">F04B 47/00</a>
Positive displacement pumps for downhole pumping	<a href="#">F04C 13/008</a>
Non-positive displacement pumps for use in mining bore holes	<a href="#">F04D 13/10</a>

**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	<a href="#">F04F 1/08</a>
Pumps using pressurised fluid medium being mixed with liquid being pumped from a great depth	<a href="#">F04F 1/20</a>

**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	<a href="#">F04F 5/00</a>
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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	<a href="#">F04B 47/022</a>
Details of the walking beam	<a href="#">F04B 47/028</a>

**E21B 43/16**

Enhanced recovery methods for obtaining hydrocarbons

**Definition statement**

This place covers:

Injecting fluids to mobilize hydrocarbons towards a production well.



**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	<a href="#">E21B 36/00</a>
Compositions for enhanced recovery methods for obtaining hydrocarbons used in combination with generated heat	<a href="#">C09K 8/592</a>

**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	<a href="#">G21</a>
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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	<a href="#">E21B 43/26</a>
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**E21B 43/25**

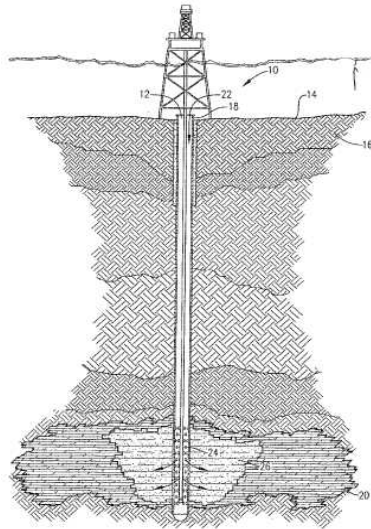
Methods for stimulating production {(by vibrating earth formations [E21B 43/003](#))}

**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	<a href="#">E21B 43/003</a>
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### Informative references

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

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

## 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	<a href="#">E21B 21/062</a>
Interconnecting wells by fracturing	<a href="#">E21B 43/17</a>
Combustion in-situ in association with fracturing	<a href="#">E21B 43/247</a>
Dissolving minerals in association with fracturing	<a href="#">E21B 43/283</a>
Chemical compositions for forming crevices or fractures	<a href="#">C09K 8/62</a>

**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	<a href="#">E21B 43/248</a>
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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	<a href="#">G21J 3/00</a>
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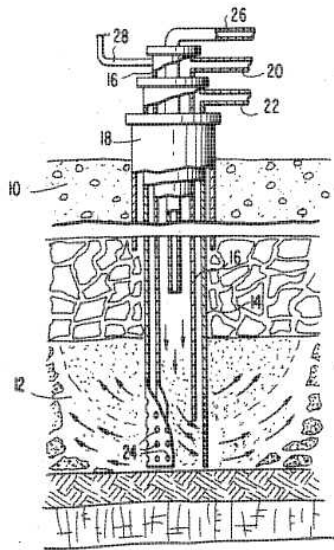
**E21B 43/267****reinforcing fractures by propping****References*****Informative references****Attention is drawn to the following places, which may be of interest for search:*

Chemical compositions for reinforcing fractures by propping	<a href="#">C09K 8/80</a>
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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	<a href="#">E21B 43/241</a>
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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	<a href="#">E21B 37/06</a>
Methods or apparatus for cleaning boreholes or wells using steerable or laterally extendable nozzles	<a href="#">E21B 43/292</a>

**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	<a href="#">E21B 36/00</a>
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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	<a href="#">E21B 43/26</a>
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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:*

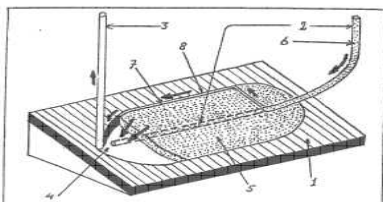
Enhanced recovery methods for obtaining hydrocarbons using heat, e.g. steam injection	<a href="#">E21B 43/24</a>
---	----------------------------

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

Heating, cooling or insulating arrangements for wells	<a href="#">E21B 36/00</a>
---	----------------------------

**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	<a href="#">E21B 43/243</a>
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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	<a href="#">E21B 43/017</a>
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## E21B 43/34

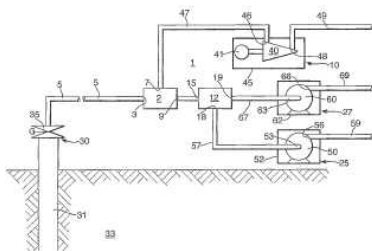
**Arrangements for separating materials produced by the well**

### Definition statement

*This place covers:*

Separation of materials produced by the well.

Illustrative example of subject matter classified in this place:



## E21B 44/00

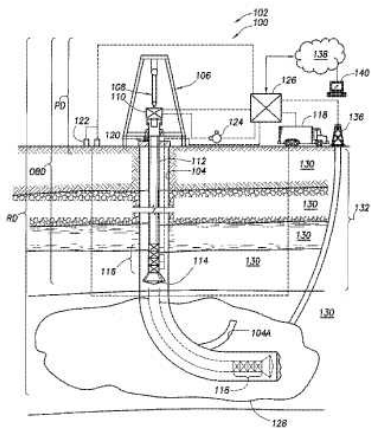
**Automatic control systems specially adapted for drilling operations, i.e. self-operating systems which function to carry out or modify a drilling operation without intervention of a human operator, e.g. computer-controlled drilling systems; Systems specially adapted for monitoring a plurality of drilling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

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	<a href="#">E21B 19/20</a>
Controlling pressure or flow of drilling fluid	<a href="#">E21B 21/08</a>
Control systems in general	<a href="#">G05</a>
Adaptive control systems	<a href="#">G05B 13/00</a>

## 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	<a href="#">B25D 9/265</a>
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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	<a href="#">E21B 21/08</a>
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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	<a href="#">E21B 49/00</a>
Geophysical logging	<a href="#">G01V</a>
Details, e.g. power supply systems for well logging instruments	<a href="#">G01V 11/002</a>

#### 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	<a href="#">G03B 37/005</a>
Closed circuit television systems	<a href="#">H04N 7/18</a>

**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	<a href="#">E21B 47/04</a>
Measuring diameter or related dimensions at the borehole	<a href="#">E21B 47/08</a>
Measuring volumes in general	<a href="#">G01F</a>

**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	<a href="#">E21B 47/07</a>
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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	<a href="#">E21B 47/09</a>
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### Informative references

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

Measuring stress in general	<a href="#">G01L</a>
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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	<a href="#">E21B 17/1014</a>
Setting or locking tools in boreholes or wells	<a href="#">E21B 23/00</a>

## 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	<a href="#">E21B 36/00</a>
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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	<a href="#">E21B 36/00</a>
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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	<a href="#">G01C</a>
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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	<a href="#">G01C</a>
Geophysics, detecting masses or objects	<a href="#">G01V</a>

**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	<a href="#">G01V 1/00</a>
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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	<a href="#">G01V 3/00</a>
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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	<a href="#">E21B 47/022</a>
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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	<a href="#">E21B 25/16</a>
Formation testing	<a href="#">E21B 49/00</a>
Geophysics; Detecting Masses or Objects	<a href="#">G01V</a>

**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	<a href="#">G01B 7/26</a>
Measuring liquid level in general and telerecorders for level of liquids	<a href="#">G01F</a>

**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	<a href="#">G01K</a>
Measuring pressure in general; Telerecorders for pressure	<a href="#">G01L</a>

**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	<a href="#">G01B</a>
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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	<a href="#">E21B 47/04</a>
Measuring borehole or well diameter	<a href="#">E21B 47/08</a>



**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	<a href="#">G01N 27/72</a>
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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	<a href="#">E21B 47/098</a>
Flow measurement in general	<a href="#">G01F</a>
Examining density and leaking in general	<a href="#">G01M</a>

**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	<a href="#">E21B 47/07</a>
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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	<a href="#">G01M 3/02</a>
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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	<a href="#">G08C</a>
Transmission of digital information, e.g. telegraphic communication	<a href="#">H04L</a>

**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	<a href="#">E21B 47/13</a>
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### Informative references

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

Magnetic or electric prospecting	<a href="#">G01V 3/00</a>
Transmission systems in which the earth is the medium	<a href="#">H04B 13/02</a>

## 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	<a href="#">G01V 3/00</a>
Electronic transmission in general	<a href="#">H04B</a>

## 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	<a href="#">G02B 6/00</a>
Optical transmission in general	<a href="#">H04B 10/00</a>

## 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	<a href="#">G01D</a>
Recording seismic data	<a href="#">G01V 1/24</a>
Recording data of measuring magnetic field characteristic of the earth	<a href="#">G01V 3/36</a>
Information storage in general	<a href="#">G11</a>

**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	<a href="#">G01N 1/00</a>
Geomodelling in general	<a href="#">G01V 20/00</a>

**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	<a href="#">G01N</a>
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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	<a href="#">E02D 1/022</a>
Measuring stresses on core or rock samples	<a href="#">G01N 33/24</a>

## 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	<a href="#">E21B 47/06</a>
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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	<a href="#">E21B 49/08</a>
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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	<a href="#">E21B 25/00</a>
Investigation of foundation soil in situ	<a href="#">E02D 1/00</a>

## 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	<a href="#">E21B 25/18</a>
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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	<a href="#">E21B 7/007</a>
Gun or shaped charge perforators	<a href="#">E21B 43/116</a>

**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	<a href="#">E21B 33/12</a>
Valve arrangements for boreholes or wells	<a href="#">E21B 34/00</a>
Analysing pressure variations in an injection or production test	<a href="#">E21B 49/008</a>

**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	<a href="#">E21B 27/00</a>
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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	<a href="#">E21B 47/10</a>
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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	<a href="#">G06N</a>
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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.