

## E21F

### SAFETY DEVICES, TRANSPORT, FILLING-UP, RESCUE, VENTILATION, OR DRAINING IN OR OF MINES OR TUNNELS

#### Definition statement

*This place covers:*

Auxiliary machines and methods specifically adapted for use in underground mines or in tunnels.

#### References

##### Limiting references

*This place does not cover:*

Machines for cutting, slitting or dislodging	<a href="#">E21C</a>
Tunnel excavating machines	<a href="#">E21D 9/00</a>

## E21F 1/00

### Ventilation of mines or tunnels; Distribution of ventilating currents (ventilating rooms or spaces in general [F24F](#))

#### Definition statement

*This place covers:*

Ventilation of mines or tunnels.

Distribution of ventilating currents.

#### References

##### Limiting references

*This place does not cover:*

Ventilating rooms or spaces in general	<a href="#">F24F</a>
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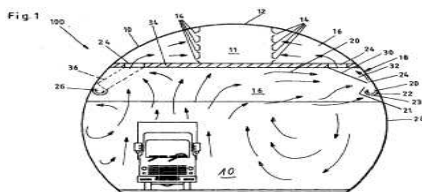
## E21F 1/003

### {Ventilation of traffic tunnels (during construction [E21F 1/04](#) - [E21F 3/00](#))}

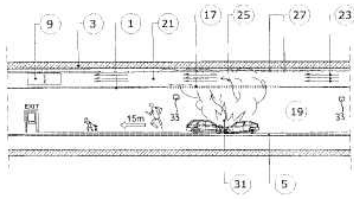
#### Definition statement

*This place covers:*

Specific modes of longitudinal or transversal flow to ensure the renewal of fresh air inside the tunnel:



Evacuation of fumes caused by a fire:



## References

### Limiting references

*This place does not cover:*

Details of air ducts	<a href="#">E21F 1/04</a>
Ventilation of traffic tunnels during construction	<a href="#">E21F 1/04</a> - <a href="#">E21F 3/00</a>
Ventilators	<a href="#">E21F 1/08</a>

### Informative references

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

Preventing escape of fumes using a central system	<a href="#">B08B 15/002</a>
Railway stations	<a href="#">B61B 1/00</a>
Railway tunnels	<a href="#">B61B 13/10</a>
Means permanently installed along the road for removing or neutralising exhaust gases	<a href="#">E01C 1/005</a>

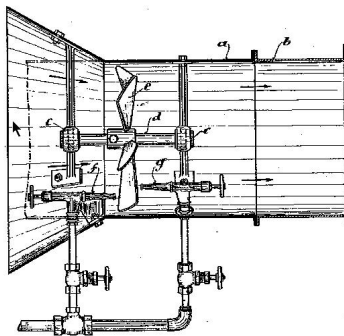
## E21F 1/08

Ventilation arrangements in connection with air ducts, e.g. arrangements for mounting ventilators ([E21F 1/003](#) takes precedence); ventilators in general [F04D](#))

### Definition statement

*This place covers:*

- Construction of ventilating ducts when the type of ventilation is determined by the ducts themselves.
- Mounting of ventilators:



## References

### *Informative references*

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

Ventilators in general	<a href="#">F04D</a>
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### **Special rules of classification**

If the ventilation is for traffic tunnels, then the document is classified in [E21F 1/003](#)

## E21F 1/10

**Air doors** (**{[E21F 1/003](#) takes precedence; air locks [E21F 1/145](#); dam doors [E21F 17/12](#)}; doors in general [E06B](#))**

### **Definition statement**

*This place covers:*

Doors that can impede air circulation into a gallery, and can be opened when air circulation is necessary.

Safety doors for avoiding the extension of a fire or of smoke.

## References

### *Limiting references*

*This place does not cover:*

Air locks	<a href="#">E21F 1/145</a>
Dam doors	<a href="#">E21F 17/12</a>

### *Informative references*

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

Doors in general	<a href="#">E06B</a>
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### **Special rules of classification**

If the ventilation is for traffic tunnels, then the document is classified in [E21F 1/003](#)

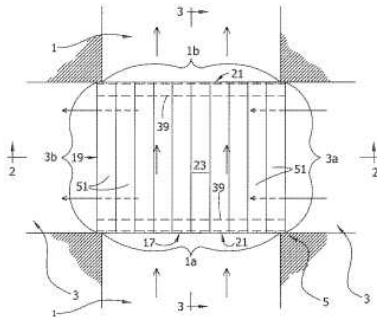
## E21F 1/14

**Air partitions; Air locks** ([E21F 1/003](#) takes precedence); dams [E21F 17/103](#); air locks for foundations [E02D](#))

### Definition statement

*This place covers:*

Fixed or adjustable constructions to regulate the flow of air into a gallery or among multiple galleries:



### References

#### Limiting references

*This place does not cover:*

Dams	<a href="#">E21F 17/103</a>
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#### Informative references

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

Air locks for foundations	<a href="#">E02D</a>
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### Special rules of classification

If the ventilation is for traffic tunnels, then the document is classified in [E21F 1/003](#)

## E21F 1/16

### Shaft covers

#### Definition statement

*This place covers:*

Covers for ventilation shafts.

### References

#### Informative references

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

Surface sealing of wellbores	<a href="#">E21B 33/02</a>
Lining of shafts	<a href="#">E21D 5/00</a>

**E21F 3/00****Cooling or drying of air (air-conditioning rooms or spaces in general [F24F](#))****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Air-conditioning rooms or spaces in general	<a href="#">F24F</a>
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**E21F 5/00****Means or methods for preventing, binding, depositing, or removing dust {(in combination with mining machines [E21C 35/22](#))}; Preventing explosions or fires (dams [E21F 17/103](#); applying liquids or other fluent materials to surfaces in general [B05](#))****Definition statement***This place covers:*

Reduction of dust in a mining atmosphere. Any means that can help prevent a fire from starting or from spreading.

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

Fire extinguishing equipment	<a href="#">A62C</a>
Fire protection in buildings	<a href="#">E04B 1/94</a>
Dust control in combination with mining machines	<a href="#">E21C 35/22</a>

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

Dams	<a href="#">E21F 17/103</a>
Applying liquids or other fluent materials to surfaces in general	<a href="#">B05</a>

**E21F 5/08****Rock dusting of mines; Depositing other protective substances****Definition statement***This place covers:*

Prevention of fires caused by ignition of coal dust and gas. A rock dust usually made of crushed limestone is sprayed to keep down the levels of coal dust.

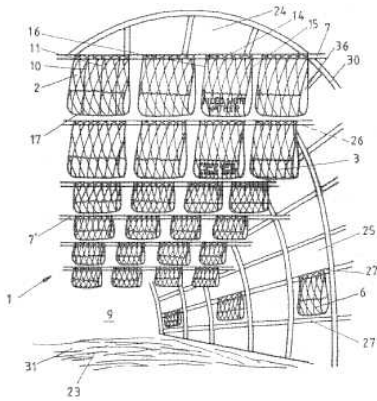
## E21F 5/14

Fluid barriers or rock dusters made to work by, or at the same time as, shots or explosions

### Definition statement

*This place covers:*

Constructions for confining explosions:



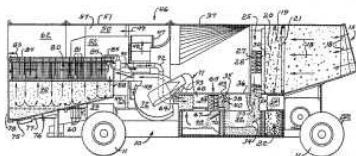
## E21F 5/20

Drawing-off or depositing dust (dust-removing while drilling [E21C 7/00](#); while slitting [E21C 35/22](#))

### Definition statement

*This place covers:*

Removal of dust from a mine atmosphere by using filters, cyclones or similar:



## References

### Limiting references

*This place does not cover:*

Dust-removing while slitting in mining operations	<a href="#">E21C 35/22</a>
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## E21F 7/00

Methods or devices for drawing-off gases with or without subsequent use of the gas for any purpose

### Definition statement

*This place covers:*

Removal of gases for safety purposes

## References

### Limiting references

*This place does not cover:*

Production of coalbed methane	<a href="#">E21B 43/006</a>
Gasification of coal underground	<a href="#">E21B 43/295</a>

## E21F 9/00

Devices preventing sparking of machines or apparatus (preventing sparking of electric machines or apparatus [H01K](#), [H02K](#))

## References

### Informative references

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

Preventing sparking of electric machines or apparatus	<a href="#">H01K</a> , <a href="#">H02K</a>
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## E21F 11/00

Rescue devices or other safety devices, e.g. safety chambers, escape ways (respiratory apparatus [A62B 7/00](#); revival apparatus [A62B 33/00](#); breathing aids for curative purposes [A61H 31/00](#))

## Definition statement

*This place covers:*

Systems and operations for protecting workers in an underground environment in case of accidents, for gaining access to the area of the accident, or for bringing the workers to surface or to a safe environment.

## References

### Limiting references

*This place does not cover:*

Alarm devices	<a href="#">E21F 17/18</a>
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### Informative references

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

Breathing aids for curative purposes	<a href="#">A61H 31/00</a>
Respiratory apparatus	<a href="#">A62B 7/00</a>
Revival apparatus	<a href="#">A62B 33/00</a>

## E21F 13/00

**Transport specially adapted to underground conditions (mine cars [B61D](#); transport in general, loading {unless specially adapted to underground conditions} [B65G](#))**

### Definition statement

*This place covers:*

Transport of staff, equipment or extracted rocks or minerals in underground operations. The transport can be vertical, inclined or horizontal. It can be continuous by conveyors or discontinuous by shuttle cars.

This main groups and its subgroups also includes the constructive details of scraper chain conveyors for collecting the coal as it is cut in longwall operations.

### References

#### Limiting references

*This place does not cover:*

Transport in general, loading unless specially adapted to underground conditions	<a href="#">B65G</a>
Removal and transport of material extracted during tunnel excavation	<a href="#">E21D 9/12</a>

#### Informative references

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

Mine cars	<a href="#">B61D</a>
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### Glossary of terms

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

Highwall mining	Method of mining by which a train typically formed by a continuous miner and multiple conveyors acting as pushbeams is propelled into a coal seam from the outside
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## E21F 13/002

**{Crushing devices specifically for conveying in mines}**

### References

#### Informative references

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

Crushing	<a href="#">B02C 4/00</a>
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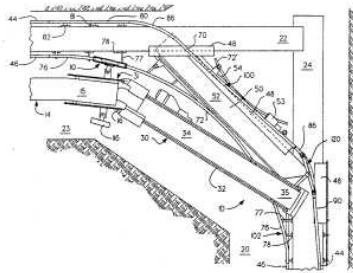


**E21F 13/006****{Equipment transport systems}****References****Limiting references***This place does not cover:*

Transport of machines for slitting or completely freeing the mineral	<a href="#">E21C 33/00</a>
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**E21F 13/02****{Transport of mined mineral} in galleries****Definition statement***This place covers:*

Means for transporting mined material to the surface or to some other point in the mine along one or more galleries:

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

Gathering at the working face	<a href="#">E21F 13/06</a>
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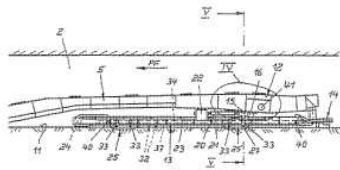
## E21F 13/08

Shifting conveyors or other transport devices from one location at the working face to another (guiding mining machines along conveyors for the cut mineral [E21C 35/12](#); in combination with mine roof supports for step-by-step movement [E21D 23/00](#))

### Definition statement

*This place covers:*

Apparatuses for moving conveyors along a gallery as the working faces advances. Self-propelled conveyors are also included:



### References

#### Limiting references

*This place does not cover:*

Guiding mining machines along conveyors for the cut mineral	<a href="#">E21C 35/12</a>
Shifting conveyors in combination with mine roof supports for step-by-step movement	<a href="#">E21D 23/00</a>

## E21F 15/00

Methods or devices for placing filling-up materials in underground workings (dams [E21F 17/103](#); chocks made of flexible containers filled with backfilling material [E21D 15/483](#))

### Definition statement

*This place covers:*

Materials for filling up mine galleries and cavities. Machines for transporting and for placing the materials. Machines such as mixing bunkers for producing the filling-up materials that are adapted for use in an underground environment.

### References

#### Limiting references

*This place does not cover:*

Dams	<a href="#">E21F 17/103</a>
Chocks made of flexible containers filled with backfilling material	<a href="#">E21D 15/483</a>

#### Informative references

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

Hydraulic cements	<a href="#">C04B 28/02</a>
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**E21F 15/005**

{characterised by the kind or composition of the backfilling material}

**References****Limiting references**

*This place does not cover:*

A method or apparatus specific for use in mines must be disclosed in combination with the composition

**Informative references**

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

Compositions of mortars, concrete or artificial stone	<a href="#">C04B 28/00</a>
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**E21F 15/02**

**Supporting means, e.g. shuttering, for filling-up materials**

**References****Informative references**

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

Reinforcing elements for concrete cast in-situ for lining tunnels or galleries	<a href="#">E21D 11/107</a>
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**E21F 15/08**

**Filling-up hydraulically or pneumatically (hydraulic or pneumatic transport devices [B65G](#); pipes, pipe couplings [F16L](#))**

**References****Limiting references**

*This place does not cover:*

Hydraulic or pneumatic transport devices	<a href="#">B65G</a>
Pipes, pipe couplings	<a href="#">F16L</a>

**Special rules of classification**

This group includes mixing bunkers

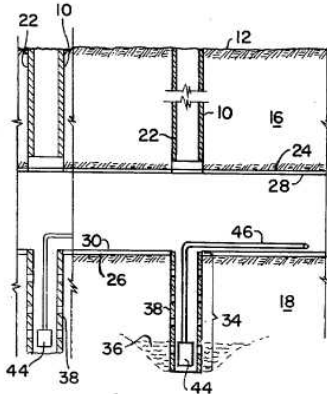
## E21F 16/00

### Drainage (keeping dry foundation sites or other areas in the ground [E02D 19/00](#))

#### Definition statement

*This place covers:*

Gathering of water surrounding a subterranean formation. Extraction of water to the outside:



#### References

##### Limiting references

*This place does not cover:*

Keeping dry foundation sites or other areas in the ground	<a href="#">E02D 19/00</a>
Waterproofing of tunnels	<a href="#">E21D 11/38</a>

## E21F 17/00

### Methods or devices for use in mines or tunnels, not covered elsewhere (mine lighting [F21](#), [H05B](#))

#### Definition statement

*This place covers:*

Methods or devices for use in mines or tunnels, not covered elsewhere

#### References

##### Informative references

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

Mine lighting	<a href="#">F21</a> , <a href="#">H05B</a>
Tracing profiles of cavities or tunnels	<a href="#">G01C 7/06</a>
Navigational instruments	<a href="#">G01C 21/00</a>
Radar systems	<a href="#">G01S 13/74</a>
Control of position of vehicles	<a href="#">G05D 1/00</a>

**E21F 17/02**

Suspension devices for tubes or the like, e.g. for ventilating ducts (supporting pipes, cables or protective tubing in general [F16L 3/00](#) - [F16L 7/00](#))

**References*****Informative references***

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

Supporting pipes, cables or protective tubing in general	<a href="#">F16L 3/00</a> , <a href="#">F16L 7/00</a>
Installation of cables in walls, ceilings or floors	<a href="#">H02G 3/26</a>

**E21F 17/103**

Dams, e.g. for ventilation

**Definition statement**

*This place covers:*

Constructions for sealing off underground volumes, such as inactive galleries.

**E21F 17/16**

Modification of mine passages or chambers for storage purposes, especially for liquids or gases (storing fluids in natural or artificial cavities or chambers in the earth [B65G 5/00](#))

**References*****Limiting references***

*This place does not cover:*

Storing fluids in natural or artificial cavities or chambers in the earth	<a href="#">B65G 5/00</a>
Excavation of large underground chambers	<a href="#">E21D 13/00</a>