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ROOF SUPPORT SUITABLE FOR USE IN MINES

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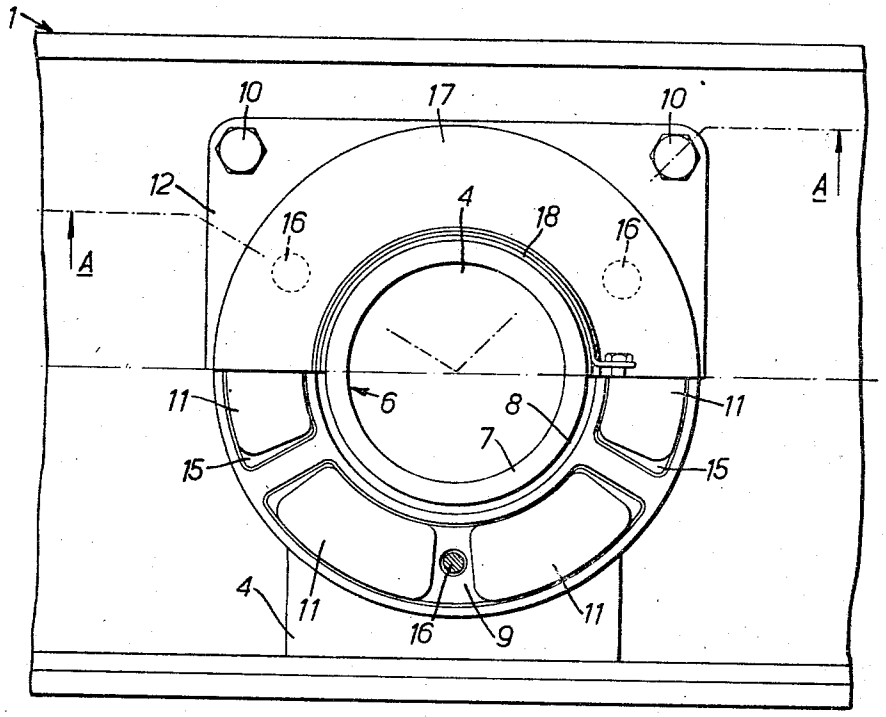

FIG. 1.

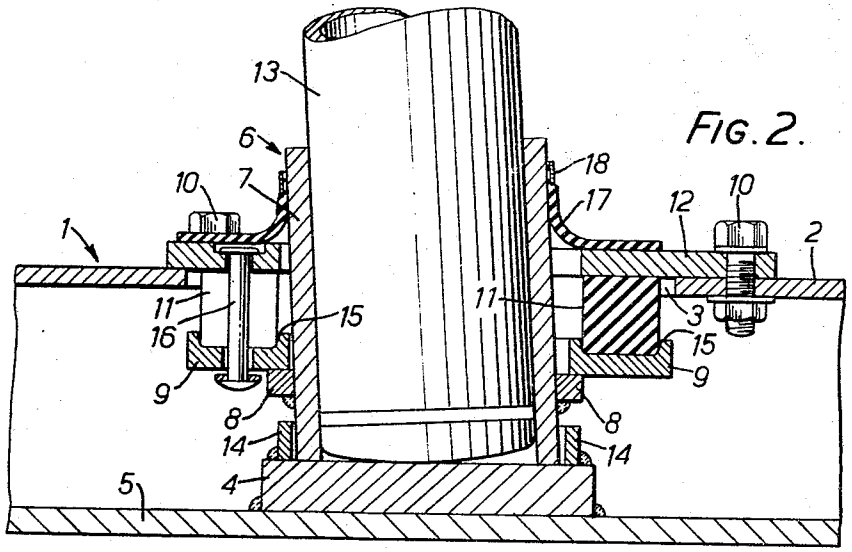

FIG. 2.

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ROOF SUPPORT SUITABLE FOR USE IN MINES

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This invention relates to roof supports, suitable for use in mines, having roof or floor members which carry resilient means arranged to act upon a prop to resiliently urge the prop to a predetermined angular position relative to the roof or floor member. The predetermined angular position may be one in which the prop is perpendicular to the roof or floor or one in which the prop is inclined to the roof or floor.

The present invention provides a roof support including a roof or floor member, a prop-receiving member having an open-ended tubular body part, one end of which engages the roof or floor member and in which an end portion of a prop can be slidably received such that the end of the prop engages the roof or floor member, and can be removed, the tubular body part having a laterally-extending projection, and resilient means acting between the roof or floor member and the projection in a direction substantially parallel to the longitudinal axis of the tubular body part, said resilient means operating to urge the body part to a predetermined angular position relative to the roof or floor member.

The resilient means may be located between two rings, one of which engages the projection extending from the tubular body part and the other of which is secured to the roof or floor member. Retaining devices may extend from one ring to the other and serve to secure the two rings and the resilient means together as a sub-assembly when detached from the roof or floor member, with the resilient means in compression.

The resilient means may be located within the roof or floor member and include a series of blocks or a continuous ring of resilient material.

One embodiment of the present invention will now be described, by way of example, with reference to the accompanying drawings of which,

FIGURE 1 is a plan view, partly broken away, of a floor member of a mine roof support, and

FIGURE 2 is a sectional view of the floor member, taken along the line A—A of FIGURE 1, and showing a prop located in the floor member.

With reference to the accompanying drawings, a mine roof support has a floor member including a beam **1** which rests upon the floor of the mine. The upper part **2** of the beam **1** has an aperture **3**, and a support member **4** is secured, for example by welding, to the inner surface of the lower part **5** of the beam **1** below the aperture **3**.

The support member **4** carries a prop-receiving member **6** which has an open-ended tubular body part **7** and a flange or projections **8** which extends or extend laterally from the external surface of a portion of the body part **7**. The flange **8** is integral with the body part **7**.

The plane of the lower end of the body part **7** may be inclined to the perpendicular to the longitudinal axis of the tubular body part **7** by a small angle, as shown, so that the longitudinal axis of the body part **7** preferably is inclined by a small angle to the perpendicular to the floor.

A lower ring **9** is seated upon the projections **8**, and the ring **9** has a series of recesses **15** each carrying two resilient elements **11**. In this embodiment, each resilient element **11** is a rubber block. The resilient elements **11** are compressed towards the lower ring **9** by an upper ring **12** which is secured in any convenient manner, for example by bolts **10**, to the upper part **2** of the beam **1**.

The lower end portion of a prop **13**, which may be a fluid-pressure-operated telescopic prop, is slidably received in the body part **7** of the prop-receiving member **6**, and the lower end of the prop **13** is convex and rests upon the support member **4**. Due to the inclination of the longitudinal axis of the body part **7** to the perpendicular to the floor, the prop **13** is also so inclined. The support member **4** carries an annular guide member **14** which surrounds the tubular body part **7** with lateral clearance, but prevents its lateral displacement.

For ease of assembly and replacement, the upper ring **12**, resilient elements **11** and lower ring **9** are held together as a sub-assembly in which the resilient elements **11** are slightly compressed, before the upper ring **12** is bolted to the floor member by bolts **10**, by three retaining devices **16**. When the upper ring **12** is bolted to the floor member, the resilient elements **11** are further compressed and the retaining devices **16** become slack.

A rubber dirt excluder **17** resting on the upper ring **12** surrounds the prop-receiving member **6** and is held in place by a hose-clip **18**. The dirt excluder **17** prevents dirt from passing through the aperture **3** into the interior of the beam **1**.

When used with an advanceable roof support, the normal orientation of the floor member will be such that the upper end portion of the prop **13** is forwardly inclined relative to the lower end portion.

The resilient elements **11** act upon the projections **8** in a direction which is substantially parallel to the longitudinal axis of the prop **13** and resiliently urge the prop-receiving member **6**, and hence the prop **13**, to the position shown in the drawing. If, in use of the roof support, a force is applied to the prop sufficient to tilt it relative to the floor member, the prop-receiving member **6** will also tilt, and part of the lower end of the tubular body part **7** will leave the support member **4**. The part of the lower end of the body part **7** remaining in contact with the support member **4** will act as a fulcrum. The further compressed resilient elements **11** will be further from the fulcrum that the less compressed resilient elements **11**, and a strong restoring moment will be exerted on the prop-receiving member **6** and on the prop **13**.

A roof-supporting load to which the prop **13** is subjected acts directly on the support member **4**, on which the lower convex end of the prop **13** rolls when the prop **13** tilts from its predetermined angular position. The point of action between the prop **13** and the support member **4** is only offset a small amount from the central axis of the prop **13**, thus avoiding high bending loads on the prop **13**.

The prop **13** can easily be removed from the floor member by sliding its lower end portion out of the body part **7** of the prop-receiving member **6**. Also, the removal of the bolts **10** allows easy removal of the sub-assembly comprising the upper ring **12**, resilient elements **11**, lower ring **9** and prop-receiving member **6**.

The described arrangement could also be used as a roof member, in which case the beam **1** would be a roof beam and the body part **7** of the prop-receiving member **6** would receive the upper end portion of the prop **13**. In the claims the beam **1** is termed generically a "surface-engageable member," to cover either manner of use.

Instead of there being a series of rubber blocks **11**, a single rubber ring may be provided. Alternatively, the resilient means may include one or more metallic springs.

I claim:

1. A roof support including a surface-engageable member, a prop-receiving member having an open-ended tubular body part, one end of which engages the surface-engageable member and in which an end portion of a prop

can be slidably received, with the end of the prop engaging the surface-engageable member, the tubular body part having a laterally-extending projection, and resilient means acting between the surface-engageable member and the projection, in a direction substantially parallel to the longitudinal axis of the tubular body part, said resilient means operating to urge the tubular body part to a predetermined angular position relative to the surface-engageable member.

2. A roof support according to claim 1 including two rings, one of which engages the projection extending from the tubular body part and the other of which is secured to the surface-engageable member, and wherein the resilient means reacts between said two rings.

3. A roof support according to claim 2 including retaining devices extending from one ring to the other to secure the two rings and the resilient means together as a subassembly when detached from the surface-engageable member.

4. A roof support according to claim 2 wherein the surface-engageable member is recessed, and the resilient means is located within such recess.

5. A roof support according to claim 2 wherein the resilient means includes a series of individual blocks of resilient material.

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