Aug. 30, 1966 A. D. ALLEN 3,269,686

MINE ROOF AND LIKE SUPPORTS

Filed Dec. 3, 1965 2 Sheets-Sheet 1

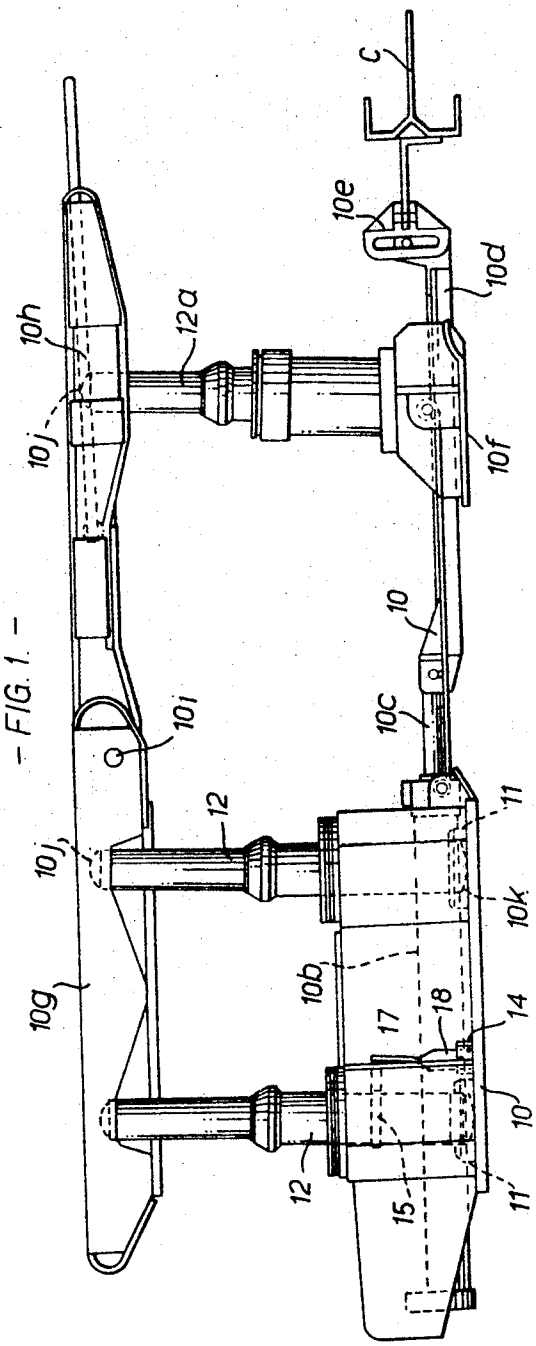


FIG. 1.

INVENTOR:

ARCHELAIUS D. ALLEN

BY

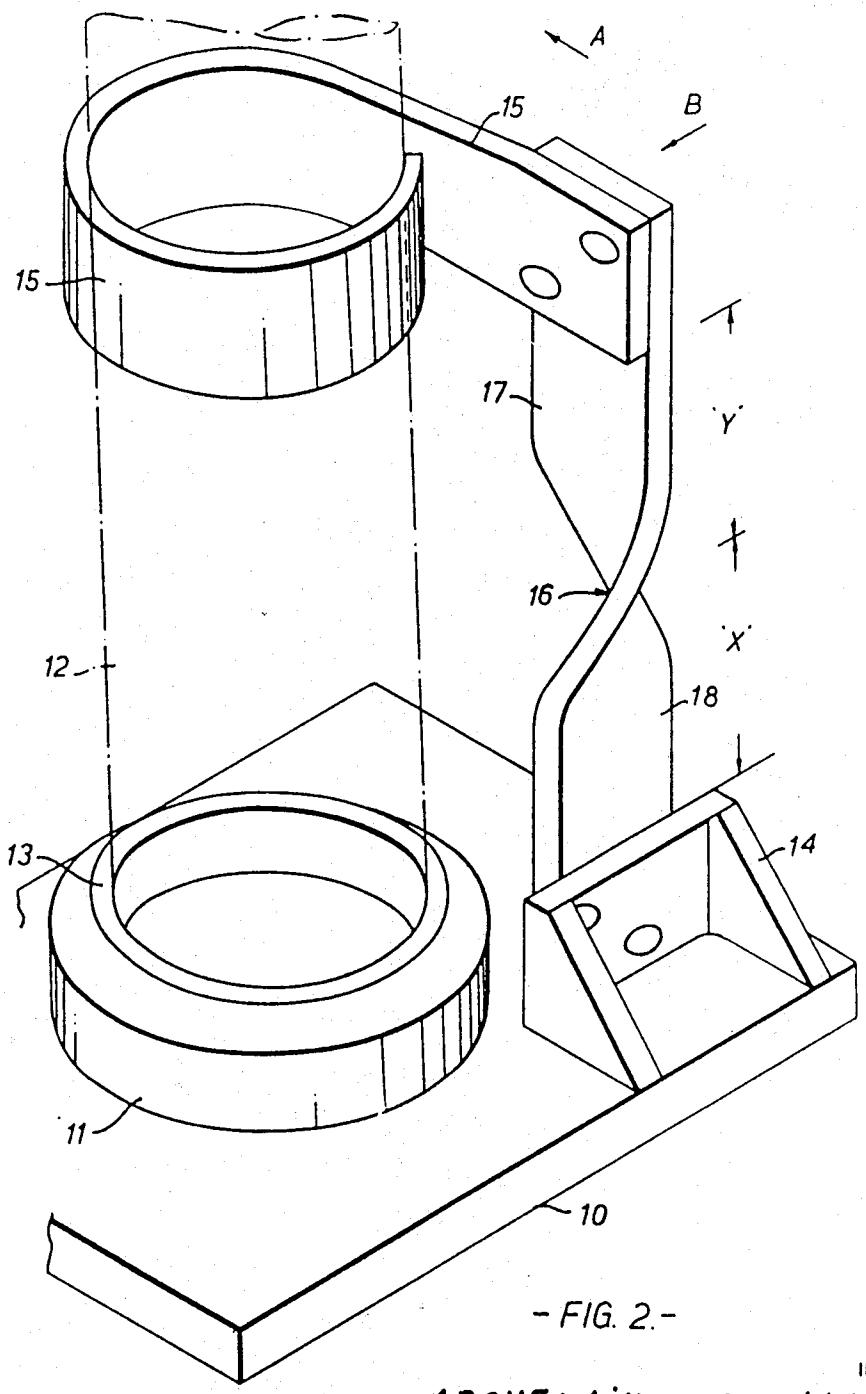
Jamison & Smiley

ATTYS.

Aug. 30, 1966 A. D. ALLEN 3,269,686

MINE ROOF AND LIKE SUPPORTS

Filed Dec. 3, 1965 2 Sheets-Sheet 2



- FIG. 2.-

INVENTOR:
ARCHELAIUS D. ALLEN
BY
Inscie & Smiley
ATTYS.

United States Patent Office 3,269,686 Patented August 30, 1966

3,269,686

MINE ROOF AND LIKE SUPPORTS

Archelaius Dawson Allen, Leyland, England, assignor to Gullick Limited, Lancashire, England, a British company

Filed Dec. 3, 1965, Ser. No. 511,892
Claims priority, application Great Britain, Dec. 23, 1964, 52,305/64
11 Claims. (Cl. 248—354)

This invention is for improvements in or relating to mine roof and like supports, of the kind having at least one leg or prop member. The invention is more particularly concerned with such mine roof and like supports in which the leg or prop member is telescopic and is adapted to be extended by means of pressure-fluid.

A typical example of such a support is the self-advancing or powered roof support which comprises one or more legs or prop members mounted in a frame and a hydraulic ram for advancing the support up to, or towards the coal face.

In one well known arrangement the ram is first extended to push a coal conveyor towards the coal face, newly exposed by the passage of a coal cutting machine, after which the support is temporarily lowered and the ram is retracted, the ram being anchored to the conveyor so that, in effect, the support is advanced up to or towards the conveyor.

It is desirable in supports of the above character that the legs or prop members should be held in the frame of the support in a substantially upright or other predetermined attitude for setting but in such a way that the legs or prop members can, to a limited extent, cant out of the vertical or other setting attitude to allow for any irregularities in the mine roof floor and/or roof.

For this reason, the legs or prop members have been mounted in resilient (e.g. rubber) mountings or bushes or alternatively have been held in position in the frame of the support by means of springs.

An object of the present invention is to provide an improved arrangement for resiliently holding a leg or prop member of a mine roof support.

According to the present invention there is provided a mine roof support including a prop or leg held by a leaf-spring device having at least two parts in transverse planes so that the leaf-spring device will hold the prop or leg resiliently against movement in at least two directions.

In one preferred embodiment of the invention the leaf-spring is twisted about its longitudinal axis so as to provide the just-mentioned two parts. By making the two parts of different lengths greater flexibility can be provided in one direction than in the other so as to meet the usual requirement that there should be a greater allowance for movement in the direction of coal face advance than in the direction of length of the seam.

One particular embodiment of the invention will now be described, by way of example, with reference to the accompanying drawing in which:

FIGURE 1 is a side elevation of a self-advancing mine roof support, and

FIGURE 2 is a perspective view of an embodiment of the invention incorporated in the support shown in FIGURE 1.

The support includes a rear unit comprising a base **10** having a plurality of sockets **11** one for each of a plurality of telescopic hydraulically extensible legs or props **12**. There may be an annular clearance between the lower end of the leg or prop and its socket **11** or the socket may be provided with a resilient (e.g. rubber) bush to receive the leg as indicated at **13** in FIGURE 2. The actual seating on the base **10** for the base or sole of the prop is of

concave/convex or other form as indicated at **10***a*, to allow for canting of the prop.

A ram **10***b* is incorporated in the support for pushing over the conveyor C and advancing the support as previously described, the piston **10***c* of the ram being attached to the conveyor by an extension bar **10***d* and a clevis **10***e*. The support also includes a forward unit having a base **10***f* and a single telescopic hydraulically extensible leg **12***a*, the base **10***f* being in the form of an arch so that the bar **10***d* can pass freely through it. The rear unit has a roof-engaging member **10***g* and the forward unit a roof-engaging member **10***h*, these two members being hinged together at **10***i*. Concave/convex seatings **10***j* are provided where the roof-engaging members rest on the legs. The base **10** is hingedly connected to the base **10***f* by a link **10***k*.

For the purpose of the present invention each leg **12** is provided with a resilient supporting device comprising a bracket **14** on the base **10** and a bracket **15** on the leg.

Connected between the bracket **14** and the bracket **15** is a leaf-spring device which is twisted at **16** so as to provide two parts **17** and **18** in planes at right-angles to one another. Thus, the leg or prop **12** is held captive, but resiliently, at a predetermined distance from its mounting **11**.

The centre of deformation **16** of the leaf-spring device **17**, **18** is located so that the length *y* of the part **17** is greater than the length *x* of the part **18**, thus greater flexibility is provided for movement of the leg or prop in the direction B, which is the direction of coal face advance, than in the direction A which is the direction of length of the seam.

The lengths of the parts **17** and **18** could be equal but in practice it is generally found desirable to allow for somewhat easier movement of the leg or prop in the direction of advance of the coal face. The arrangement above described provides a very convenient means for doing this simply by selecting an appropriate ratio between *x* and *y*.

Instead of locating the spring device **17**, **18** or an equivalent device at the lower end of the prop it could be located at the upper end in which case it would be connected between a bracket on the prop and a suitable bracket or anchorage on the roof-bar structure or canopy.

The leg **12***a* may be provided with a similar resilient supporting device.

I claim:

1. A mine roof support including a pivotally mounted prop member held by a leaf-spring having at least two parts in transverse planes whereby said leaf-spring device will hold the prop resiliently against movement in at least two transverse directions.

2. A mine roof support as claimed in claim **1** wherein the leaf-spring is twisted about its longitudinal axis so as to provide said two parts.

3. A mine roof support as claimed in claim **1** wherein the two parts of the leaf-spring are of different lengths whereby greater flexibility is provided in one direction than in the other.

4. A mine roof support as claimed in claim **2** wherein the two parts of the leaf-spring are of different lengths whereby greater flexibility is provided in one direction than in the other.

5. A mine roof support as claimed in claim **1** wherein a lower end of the leaf-spring is attached to a base member of the support and an upper end of the leaf-spring is attached to a laterally extending bracket on the prop member.

6. A mine roof support as claimed in claim **1** wherein an upper end of the leaf-spring is attached to a roof-bar structure of the support and a lower end of the leaf-

spring is attached to a laterally extending bracket on the proper member.

7. A mine roof support as claimed in claim 5 wherein the laterally extending bracket has a part which, at least partially, embraces the prop member.

8. A mine roof support as claimed in claim 6 wherein the laterally extending bracket has a part which, at least partially, embraces the prop member.

9. A mine roof support as claimed in claim 1 and having a base provided with a socket in which the prop member is positioned for pivoting movement on said base.

10. A mine roof support as claimed in claim 9 wherein said socket is provided with a resilient bush to receive the prop member.

11. A mine roof support as claimed in claim 1 wherein the two parts of the leaf-spring are of different lengths whereby greater flexibility is provided in one direction than in the other and wherein the support further comprises means for advancing it towards a mineral face and wherein the leaf-spring is positioned so that the greater flexibility is provided for movement of the prop member in a direction towards the mineral face.

No references cited.

CLAUDE A. LE ROY, *Primary Examiner.*