

Dec. 2, 1958

A. L. SCOTT ET AL

2,862,650

LADDER

Filed July 18, 1957

2 Sheets-Sheet 1

Fig. 2.

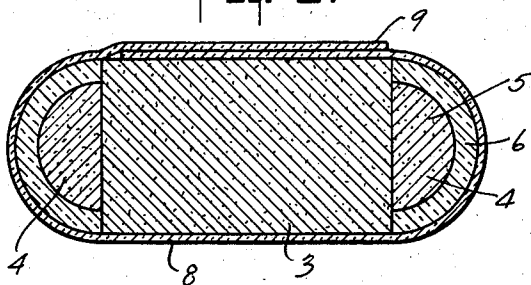


Fig. 3.

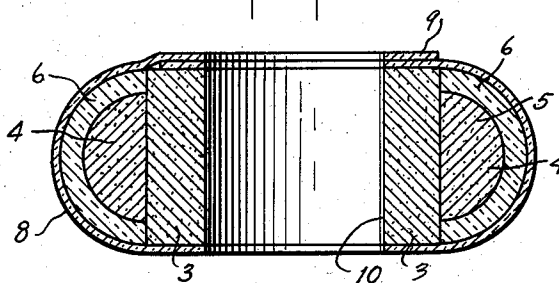


Fig. 1.

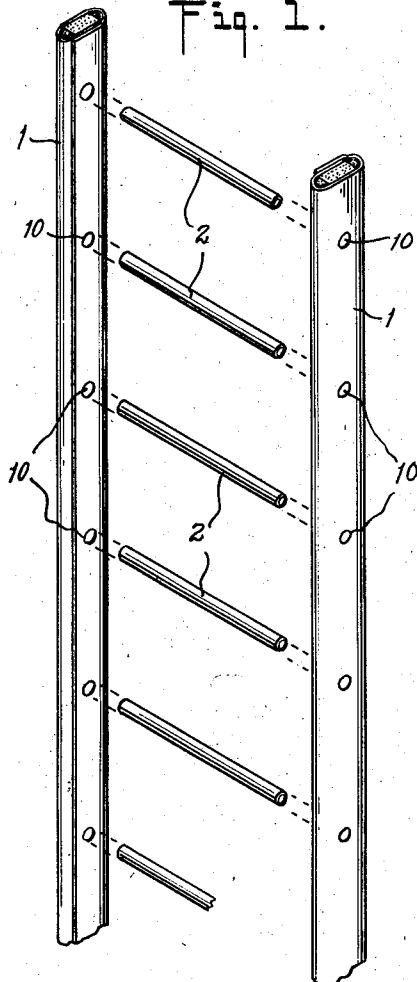


Fig. 4.

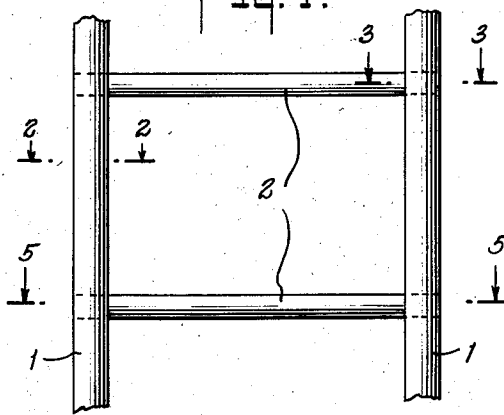
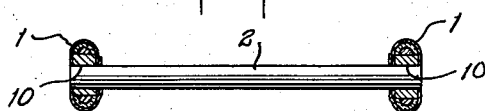


Fig. 5.



INVENTORS
ARTHUR L. SCOTT
STEPHEN W. TREWHELLA
BY
Kernyon & Kernyon
ATTORNEYS

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Fig. 6.

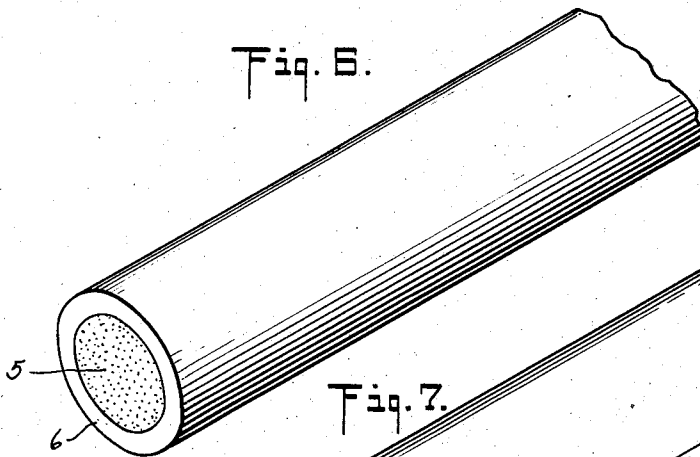


Fig. 7.

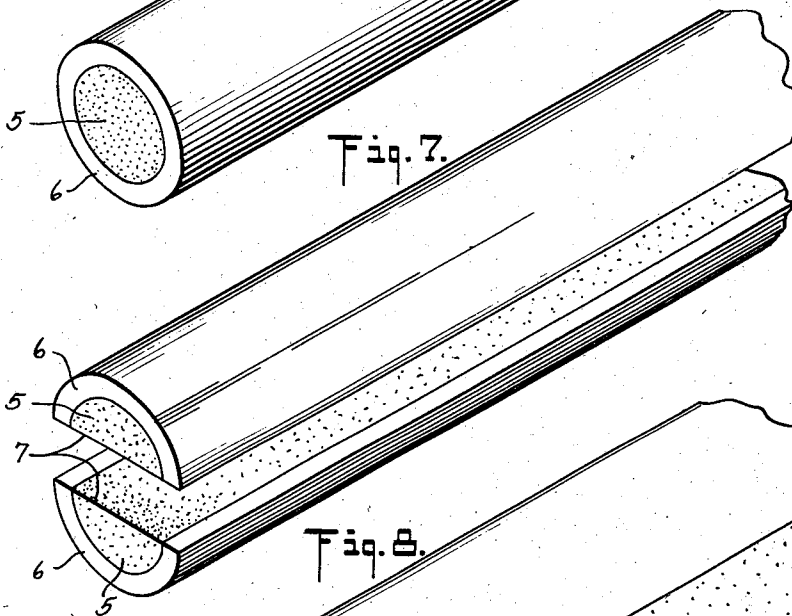
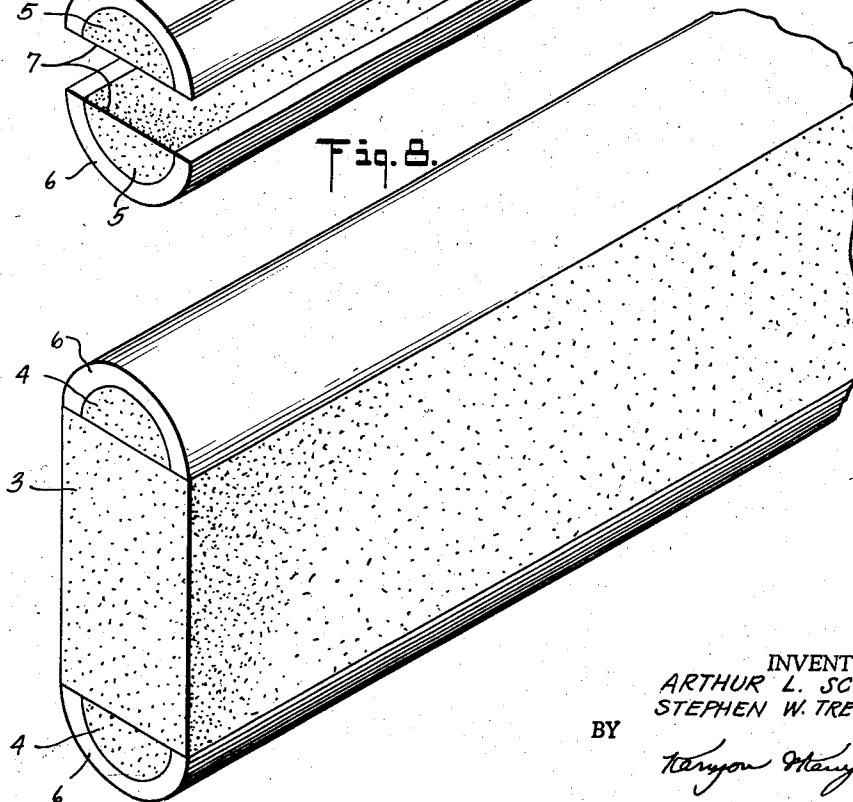


Fig. 8.



INVENTORS
ARTHUR L. SCOTT
STEPHEN W. TREWHELLA
BY
Henry H. Henson
ATTORNEYS

2,862,650

LADDER

Arthur L. Scott and Stephen W. Trehwella, Columbia, S. C., assignors to Columbia Products Company, Columbia, S. C., a corporation of South Carolina

Application July 18, 1957, Serial No. 672,592

6 Claims. (Cl. 228—58)

This invention relates to ladders and particularly to ladders suitable for use by linemen or others who work around high tension wiring or the like.

Heretofore it has been necessary for linemen to use ladders made entirely of wood so as to avoid the dangers inherent in working around high tension wires. Although reinforced ladders are available on the market, because these reinforcements are made of conducting metal these ladders cannot be used. Consequently it has been necessary to use ladders which are relatively heavy and difficult to handle. Lightweight metallic ladders are, of course, out of the question.

The present invention consists of a ladder which is light in weight and which has dielectric qualities which make it safe for use by linemen and which although light in weight is strong enough to serve the purposes of a ladder.

One of the objects of the invention is to produce such a ladder which overcomes the objection to ladders heretofore used.

Another object is to provide such a ladder which is light in weight because it is built primarily of lightweight dielectric hardened foam material which is reinforced and combined simply and inexpensively with fiber glass material which is likewise dielectric in its properties.

The invention is shown in the accompanying drawings in which—

Fig. 1 is a perspective view of the ladder showing the parts in disassembled relationship;

Fig. 2 is a cross-sectional view through one of the side members of the ladder taken on the line 2—2 of Fig. 4;

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 4 with the rung omitted;

Fig. 4 is an enlarged detailed view showing a portion of the complete assembled ladder;

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 4;

Fig. 6 is a perspective view of a rod showing how the edge reinforcing members are made;

Fig. 7 is a perspective view showing the rod of Fig. 6 sliced to form reinforcing members; and

Fig. 8 is a perspective view showing an assembly of parts going to form side members of the ladder in partially completed form.

The ladder consists generally of side members 1 and rungs 2. Each of the side members is made up of an elongated boardlike member 3 consisting of lightweight porous dielectric material. This material may be hardened cellulose acetate foam which has a density of from 7–8 pounds per cubic foot and a compressive strength of about 200 pounds per square inch. Such material is used for insulation. Similar materials used for such purposes can be used in carrying out this invention, provided that they have the desired dielectric properties and are lightweight. When combined with glass as in this invention, they will serve the purpose.

At the edges of the elongated boardlike member are disposed reinforcing members 4 which in the preferred

form of the invention are half-rounds having a core 5 of the same lightweight porous dielectric material having on the surface thereof a layer 6 comprising glass fibers all extending parallel to the axis of the half-round and joined thereto and to one another by a suitable plastic material such as is commonly used for joining glass fibers together in the manufacture of rods or the like. In manufacture, the core 5 is covered with a layer of the glass fibers which have been coated with the plastic material. These are then bound together and are heated to cure the plastic binder material. Thereafter the rod thus formed is split on a diametric line indicated at 7 in Fig. 7 to form the two half-rounds which have a diameter equal to the thickness of the core member 3. The two half-round members 4 are then disposed along the edges of the boardlike core member 3 and are secured thereto by a suitable cement which may or may not be cured after application.

It will be appreciated that the reinforcing glass fibers may be applied directly to the edges of the boardlike member 3 in order to reinforce them, and that the material corresponding to the core 5 may be omitted or may be formed integrally on the member 3.

Thereafter an overwrap 8 of cloth made of glass fibers is wrapped around the core 3 and the half-round edge reinforcing members 4. Preferably the cloth overlaps, as indicated at 9, on the inner face of the side members. The overwrap of glass fiber cloth is secured on the surface by suitable cement and the overlapping portions are likewise suitably secured by cement.

The rungs 2 are fitted in holes 10 formed in the side members, which holes extend through both the glass cloth overwrap 8 and the core 3. The rungs may be suitably secured by cement or may be otherwise fastened. The rungs 2 may be made of any suitable material. Fiber glass may be employed, but in cases where abrasion may be an important factor, even metallic rungs may be utilized.

The resulting ladder may be very lightweight and because of the high tensile strength of the glass fiber in the layer 6 and in the overwrap, the side members are quite rigid and resistant to bending. The glass fibers serve as tension members to resist bending, and since they are spaced well apart by the core 3 they are most effective as tension members to resist bending of the side members. The glass cloth overwrap and particularly the overlapped portion thereof form adequate reinforcement for the foam material of the boardlike member 3 so that the rungs are adequately supported for use.

The entire ladder has dielectric or insulating properties which make it suitable for high tension wiring and the like, and the ladder is so light that it can be easily handled by one man, even in quite long lengths.

It will be appreciated that the invention has been shown in its preferred form in the drawings and specification. It will be understood, however, that other forms of the invention may be utilized and that the form shown by way of illustration is not intended to limit the invention.

The appended claims define the invention.

We claim:

1. A ladder comprising a pair of side pieces, each consisting of an elongated boardlike member consisting of light weight porous dielectric hardened cellulose acetate foam and having reinforcing edge members joined thereto, each consisting of a half-round having a core of said lightweight porous dielectric material and a surface layer comprising glass fibers extending parallel to the axis of said half-round and joined thereto and to one another by dielectric plastic material, an overwrap of glass fiber cloth surrounding said boardlike member and said half-rounds joined to said side member with dielectric cement, and rungs extending between said side members fitted in holes extending through said fiberglass cloth and said side mem-

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ber whereby said rungs are supported by said glass cloth and said dielectric porous material and said side members are reinforced against bending by the glass fibers of said half-rounds and said glass cloth.

2. A ladder comprising a pair of side pieces, each consisting of an elongated boardlike member consisting of light weight porous dielectric hardened foam and having reinforcing edge members joined thereto, each consisting of a half-round having a core of said lightweight porous dielectric material and a surface layer comprising glass fibers extending parallel to the axis of said half-round and joined thereto and to one another by dielectric plastic material, an overwrap of glass fiber cloth surrounding said boardlike member and said half-rounds joined to said side member with dielectric cement, and rungs extending between said side members fitted in holes extending through said fiberglass cloth and said side member whereby said rungs are supported by said glass cloth and said dielectric porous material and said side members are reinforced against bending by the glass fibers of said half-rounds and said glass cloth.

3. A ladder comprising a pair of side pieces, each consisting of an elongated boardlike member consisting of lightweight porous dielectric hardened cellulose acetate foam and having reinforcing edge members joined thereto, each consisting of a core of said lightweight porous dielectric material and a surface layer comprising glass fibers extending parallel to the axis of said reinforcing edge member and joined thereto and to one another by dielectric plastic material, an overwrap of glass cloth surrounding said boardlike member and said edge members and joined to said side member with dielectric cement, and rungs extending between said side members fitted in holes extending through said fiberglass cloth and said side member whereby said rungs are supported by said glass cloth and said dielectric porous material and said side members are reinforced against bending by the glass fibers of said reinforcing edge member and said glass cloth.

4. A ladder comprising a pair of side pieces, each consisting of an elongated boardlike member consisting of lightweight porous dielectric hardened foam and having reinforcing edge members joined thereto, each consisting of a core of said light weight porous dielectric material and a surface layer comprising glass fibers extending parallel to the axis of said reinforcing edge member and joined thereto and to one another by dielectric plastic material, an overwrap of glass cloth surrounding said boardlike member and said edge members and joined to said side member with dielectric cement, and rungs ex-

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tending between said side members fitted in holes extending through said fiberglass cloth and said side member whereby said rungs are supported by said glass cloth and said dielectric porous material and said side members are reinforced against bending by the glass fibers of said reinforcing edge member and said glass cloth.

5. A ladder comprising a pair of side pieces, each consisting of an elongated boardlike member consisting of lightweight porous dielectric hardened foam and having reinforcing edge members each including a surface layer comprising glass fibers all extending parallel to the axis of said side piece and joined thereto and to one another by dielectric plastic material, an overwrap of glass fiber cloth surrounding said side member and joined to said side member with dielectric cement, and rungs extending between said side members fitted in holes extending through said fiberglass cloth and said side member whereby said rungs are supported by said glass cloth and said dielectric porous material and said side members are reinforced against bending by the glass fibers at the edges thereof and said glass cloth.

6. A ladder comprising a pair of side pieces, each consisting of an elongated boardlike member consisting of light weight porous dielectric hardened foam and having reinforcing edge members joined thereto, each consisting of a core of said lightweight porous dielectric material and a surface layer comprising glass fibers extending parallel to the axis of said reinforcing edge member and joined thereto and to one another by dielectric plastic material, an overwrap of glass fibers surrounding said boardlike member and said edge members and joined to said side member with dielectric cement, and rungs extending between said side members fitted in holes extending through said overwrap and said side member whereby said rungs are supported by said overwrap and said dielectric porous material and said side members are reinforced against bending by the glass fibers of said reinforcing edge member and said overwrap.

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