# United States Patent

[11] 3,619,009



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[22] Filed **Apr. 20, 1970**
[45] Patented **Nov. 9, 1971**



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**Continuation-in-part of application Ser. No. 830,183, May 7, 1969, now abandoned.**


[54] **SCALING BAR**
**14 Claims, 5 Drawing Figs.**


[52] **U.S. Cl.** ..... **299/91,** 16/114 R, 138/DIG. 2, 138/143, 294/57, 299/94
[51] **Int. Cl.** ..... **E21c 37/26**
[50] **Field of Search** ..... 299/91–94; 175/320; 138/143, DIG. 2; 306/30; 294/57, 58; 15/143, 145; 16/114, 116



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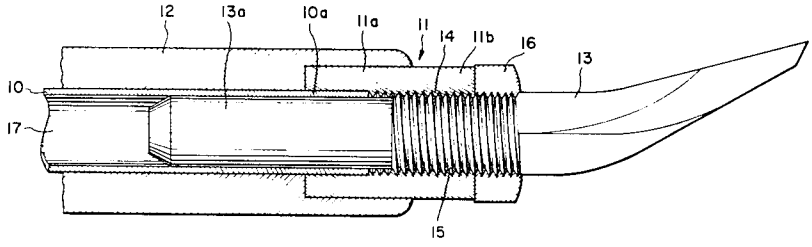
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**ABSTRACT:** A scaling bar for prying overhanging rock from mine tunnels and the like. An elongate, relatively thin-walled tube of lightweight material, such as aluminum, has an end closely fitted into engagement with and secured to one end of a relatively thick-walled coupling that is internally threaded at its other end for the reception of the externally threaded end of a scaling point. The tube and at least part of the sleeve coupling are covered with a resin-impregnated fiber glass that is bonded intimately thereto. Various forms of scaling points can be screwed into the coupling from time to time, each being secured in place by a lock nut on its shank. The opposite end of the tube is preferably provided with a similar coupling for the reception of a second scaling point, a handle, an adapter for a second tube, or merely a plug.

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SHEET 1 OF 2

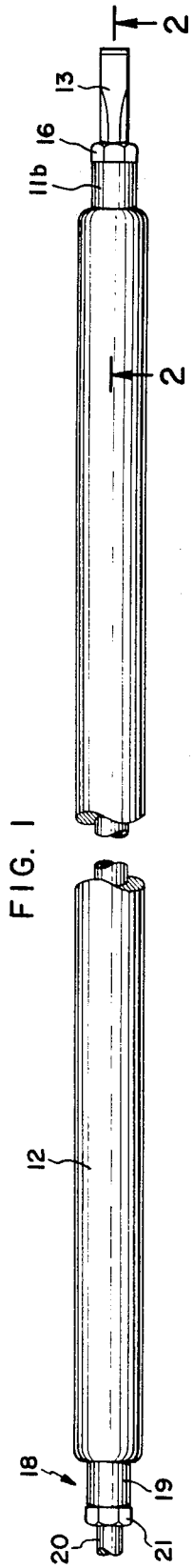



FIG. 1

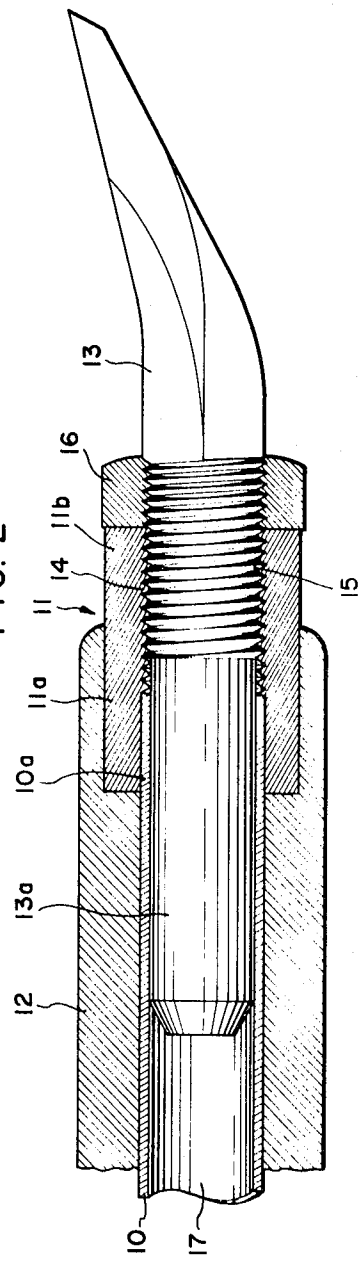



FIG. 2

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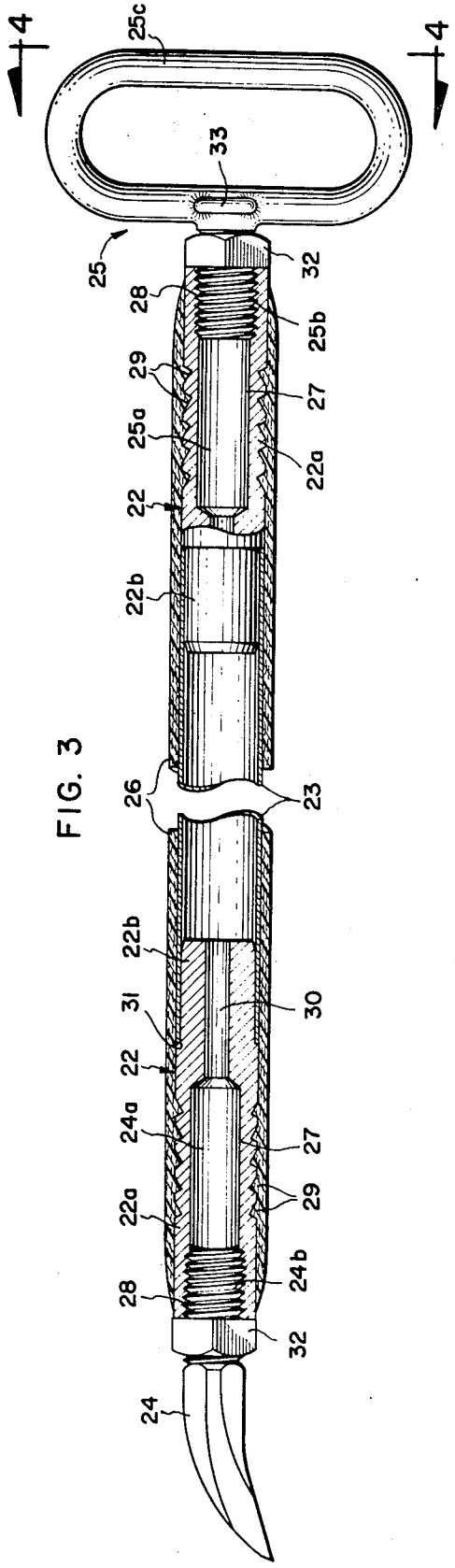



FIG. 3

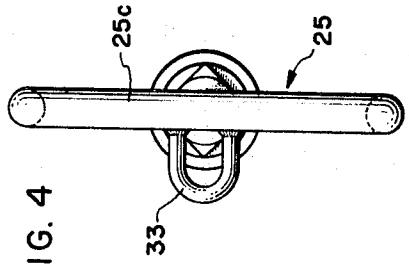



FIG. 4

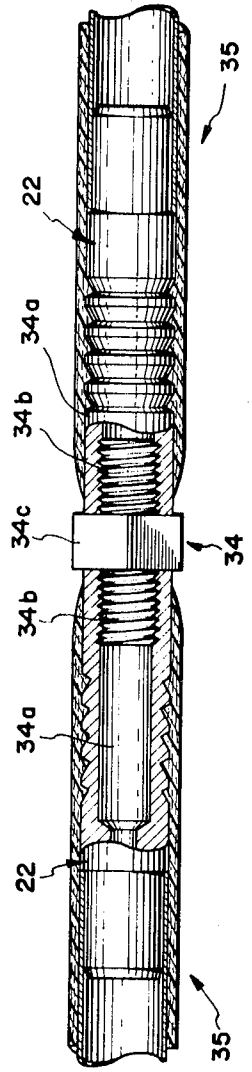



FIG. 5

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# SCALING BAR

## RELATED APPLICATION

This application is a continuation-in-part of copending application Ser. No. 830,183 filed May 7, 1969.

## BACKGROUND OF THE INVENTION

1. Field

The invention is in the general field of scaling bars as employed by the mining and related industries for use by miners and other workmen to pry loose rocks or other materials from the roof of a tunnel, mine drift, or the like, as a safety precaution against injury to workers in such an area by accidental falls of rock or other materials.

2. Objectives

In the making of the invention it was a principal purpose to provide an unusually lightweight scaling bar having required flexibility throughout its length, yet being strongly resistant to destructive deformation and having scaling points of requisite hardness and strength mounted rigidly for effective prying.

3. State of the Art

Heretofore, scaling bars have either been heavy steel bars with permanent points, or have been hollow tubes of aluminum having scaling point inserts secured by riveting or otherwise in the ends. The heavy steel bars are durable and effective, but are unwieldy and extremely hard on the workman. Such a bar can be used for only a short time without excessively tiring the one doing the scaling, and is ordinarily passed from one man to another throughout the working period. The aluminum scaling bars are much easier to handle, but are easily bent out of shape and cannot be bent back into shape satisfactorily.

## SUMMARY OF THE INVENTION

The objectives of the invention are achieved by using a length of relatively thin-walled tubing of lightweight material, such as aluminum, as a core for a protective and strengthening wrapping of fiber glass impregnated with a plastic resin material, such as an epoxy resin. One of the open ends of the length of tubing is closely fitted into engagement with one end of a relatively heavy-walled coupling by insertion of one into the other and securement of the one to the other, as by means of a press fit. The other end of such coupling is adapted to receive and secure the shank of a scaling point. An ideal securement is provided by internally threading the shank-receiving end of the coupling and by externally threading the shank of the scaling point. This enables the point to be secured in place by a locknut carried by the shank. The fiber glass is wrapped around the tube and around at least part of the length of the sleeve coupling and is impregnated with a resin that bonds tightly to the tube. Both ends of the tube are preferably provided with a coupling as described, so scaling points can be mounted at both ends or so that a scaling point can be mounted at one end and a handle, adapter for a second length of tubing, or a plug can be mounted at the opposite end.

## THE DRAWINGS

Particular constructions presently contemplated as the best modes of carrying out the invention in practice are illustrated in the attached drawings in which:

FIG. 1 is an elevation of one form of the scaling bar, with a scaling point mounted at one end and another scaling point or other item, such as a handle (shown fragmentarily), at the opposite end, an intermediate portion of the bar being broken out for convenience of illustration;

FIG. 2, a fragmentary longitudinal section taken along the line 2—2 of FIG. 1 and drawn to a larger scale;

FIG. 3, a view corresponding to that of FIG. 1 but drawn to a considerably larger scale and being partly in longitudinal axial section, with a scaling point at one end and a handle at the other;

FIG. 4, an elevation of the handle end of the scaling bar of FIG. 3; and



FIG. 5, a fragmentary longitudinal axial section of the scaling bar of FIG. 3, with the handle replaced by an adapter connector for a second scaling bar.

## DETAILED DESCRIPTION OF ILLUSTRATED EMBODIMENTS

In the particular form illustrated in FIGS. 1 and 2, a length of lightweight tubing **10**, preferably aluminum, provides an elongate, relatively thin-walled tube having an end portion **10***a* closely fitted into and secured, as by means of a press fit, to one end portion **11***a* of a relatively thick-walled sleeve coupling **11**, preferably of steel. Covering the tube **10** and at least the end portion **11***a* of the coupling **11** is a relatively thick jacket **12** of fiber glass impregnated with a synthetic resin such as an epoxy or the like, which serves to bond the jacket to tube and coupling. The fiber glass is preferably spirally wound.

The opposite end portion **11***b* of the coupling **11** is formed to receive the shank of a scaling point **13**, and means are provided for securing the shank within the coupling. In the form illustrated, such means include screw threading **14** internally of the coupling end portion **11***b*, screw threading **15** externally of the shank of the scaling point **13**, and a locknut **16** carried by the threaded portion of the shank. An unthreaded, elongate, terminal portion **13***a* of the shank is of such diameter as will closely fit within the bore **17** of the tube.

The opposite end of the scaling bar, see **18**, FIG. **1**, is preferably similarly provided with a sleeve coupling **19** for receiving either a second scaling point of selected type, a handle having the required shank **20** and a locknut **21**, or a plug (not shown). If desired, nothing need be inserted in coupling **19**.

The thickness of the jacket **12** and the relative wall thicknesses of tube **10** and coupling **11** can vary depending upon the degree of resiliency and/or strength required for particular instances of use.

In the embodiment of FIGS. **3–5**, the couplings **22** that are fitted and secured to respective opposite ends of the relatively thin-walled tube **23** are somewhat different in formation than the couplings **11** and **19** previously described and are interconnected with the tube somewhat differently. Thus, each coupling **22** is longer, so that an end portion **22***a* will accommodate the entire shank **24***a* of the scaling tip **24**, or the entire shank of some other received item, such as the shank **25***a* of the handle **25**, and so that the other end portion **22***b* will extend in a press fit within the corresponding end portion of the tube. The scaling tips and other received items remain the same for this embodiment, but the tube is larger in diameter to accommodate the coupling. The jacket **26** is preferably reduced in thickness, so the outside diameter of the bar is about the same for convenient gripping by a workman. This form of the scaling bar of the invention has been found to be both stronger and more economical to produce than that previously described.

The elongate end portion **22***a X* of a coupling **22** is deeply recessed, as at **27**, to receive the shank of the attached item, such as the shank **24***a* of the scaling tip **24** or the shank **25***a* of the handle **25**, and is internally threaded, as at **28**, at the mouth of recess **27** for engaging external threading, see **24***b* or **25***b*, at the root of the shank. It is advantageously annularly grooved externally, as at **29**. The other end portion **22***b* of a coupling **22** is also elongate, so as to fit deeply into an end of tube **23**, and is preferably provided with a bore **30** along its length for the sake of lightness. It is of reduced diameter to provide both an abutment shoulder **31** for tube **23** and a press fit within such tube. Its diameter is preferably such that the outside of the tube is flush with the outside of the end portion **22***a* of the coupling.

As in the first embodiment, tube **23** is covered by jacket **26** of resin-impregnated fiber glass cloth or spiral-wound fiber glass filaments. Such jacket preferably extends over practically the entire lengths of the couplings at opposite ends of tube **23**, filling the annular grooves **29** and bonding to expose surfaces of the couplings and the tube.

Scaling tips 24 or such a scaling tip and a handle 25, see FIG. 3, are installed in the couplings 22 at opposite ends of the jacketed tube 23 by screwing them in so that their shanks abut the bottom of the recesses 27 of the respective couplings, whereupon respective locknuts 32, in place on the threaded root portions of the respective shank, are screwed down tightly against the adjacent coupling ends to firmly secure the scaling tips or handle in place.

Handle 25 is preferably provided with a handhold portion 25c of loop formation, and a small securement loop 33 is advantageously provided for receiving the end of a safety rope which is tied in place when using the scaling bar over grizzlies or other areas where the bar would be lost if dropped.

Very satisfactory results have been had when the tube 23 has an outside diameter of 1¼ inches and a wall thickness of 0.035 inches and is covered by a jacket 26 of one-eighth inch thickness.

In some instances it is desirable to have an extra long scaling bar. This can be easily achieved with the invention by making use of an adapter-connector 34, FIG. 5, to join the couplings 22 at juxtaposed ends of two scaling bars 35. Such adapter-connector 34 has two shanks 34a with externally threading 34b at their roots, such shanks extending oppositely from a section 34c which is advantageously of hexagonal formation for receiving a wrench. While the section 34c is held against turning, the scaling bars 35 are screwed tightly onto the respective shanks 34a, thereby providing in effect a double-length scaling bar.

Whereas this invention is here illustrated and described with respect to certain preferred forms thereof, it is to be understood that many variations are possible without departing from the inventive concepts particularly pointed out in the claims.

I claim:

1. A scaling bar, comprising an elongate tube; a coupling having one end portion closely fitted into engagement with an end of said tube and the opposite end portion recessed to removably receive the shank of a scaling point; a jacket of resin-impregnated fiber glass covering and bonded to said tube and to at least the said one end portion of the coupling; and means for securing said shank within said coupling, said tube being thin-walled relative to said coupling.

2. A scaling bar according to claim 1, wherein the tube is a length of strong but lightweight tubing.

3. A scaling bar according to claim 1, wherein the means for securing the shank of a scaling point within the coupling are screw threads formed internally of the said opposite end of the coupling.

4. A scaling bar according to claim 1, wherein the opposite end of the tube is provided with a similar coupling.

5. A scaling bar according to claim 1, wherein there is additionally included a scaling point having a shank removably inserted in and secured to the recessed opposite end portion of the coupling.

6. A scaling bar according to claim 5, wherein the recessed opposite end portion of the coupling is internally threaded and the shank of the scaling point is externally threaded to provide the securing means.

7. A scaling bar according to claim 6, wherein the securement means also includes a locknut carried by the external threading of the shank.

8. A scaling bar according to claim 6, wherein the shank has an elongate terminal portion that is unthreaded and closely fit within and extending along the bore of the tube.

9. A scaling bar according to claim 1, wherein the one end portion of the coupling is elongate and closely fitted within and extending along the bore of the tube, and wherein the opposite end portion is elongate and deeply recessed to receive the shank of a scaling tip.

10. A scaling bar according to claim 9, wherein there is additionally included a scaling point having a shank removably inserted in and secured to the recessed opposite end portion of the coupling with its end abutting the bottom of the recess; and wherein the securing means comprises mutually engaged screw threading internally of the recess and externally of the shank, and a locknut threaded onto the said shank and bearing against the adjacent end of the tube.

11. A scaling bar according to claim 10, wherein the one end portion of the coupling is of reduced diameter so the outside of the tube is substantially flush with the outside of the opposite end portion of the coupling.

12. A scaling bar according to claim 10, including a similar coupling at the opposite end of the tube and a handle similarly coupled to said opposite end of the tube.

13. A scaling bar according to claim 12, wherein the handle has an appended loop for the securement of a safety rope.

14. A scaling bar according to claim 10, including a similar coupling at the opposite end of the tube, and a similar tube similarly coupled to said opposite end of the tube by an adapter-connector to provide temporary extended length for said scaling bar.

* * * * *

# UNITED STATES PATENT OFFICE
# CERTIFICATE OF CORRECTION

Patent No. 3,619,009 Dated November 9, 1971

Inventor(s) Paul C. O'Leary

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 3, line 40, "the said one end portion" should read -- part --.

Signed and sealed this 29th day of August 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents

FORM PO-1050 (10-69)

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* U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334