Feb. 28, 1967 E. M. ASBURY 3,306,180

APPARATUS FOR SUPPORTING MINE BRATTICES

Filed Feb. 18, 1965

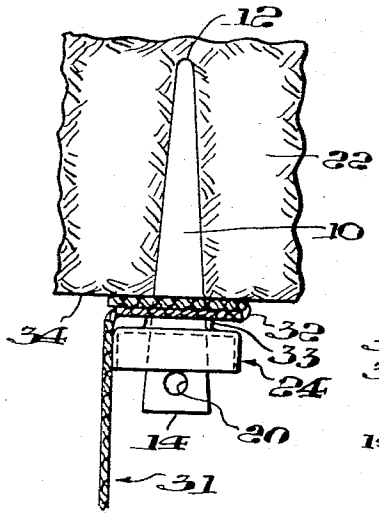


Fig. 1.

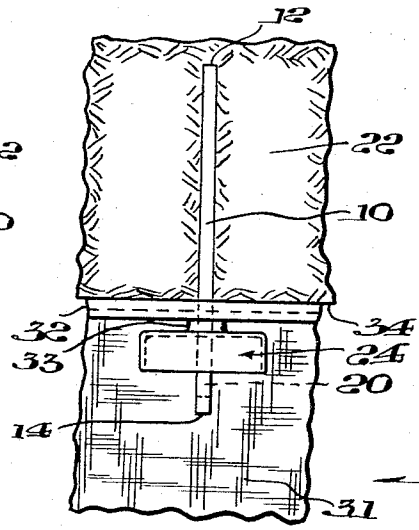


Fig. 2.

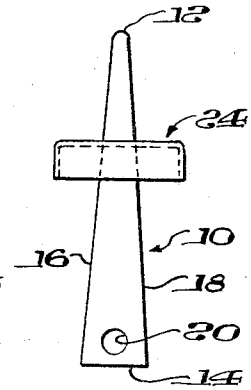


Fig. 3.

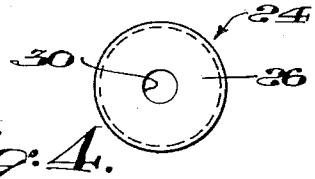


Fig. 4.

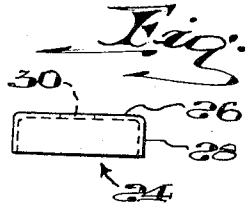


Fig. 5.

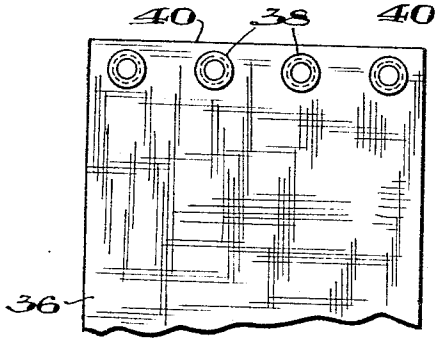


Fig. 6.

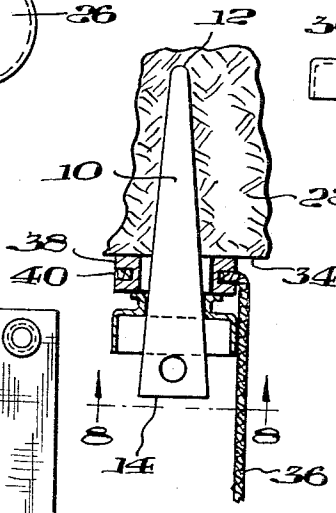


Fig. 7.

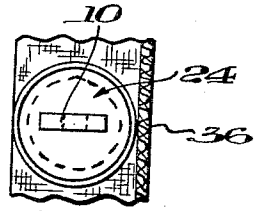


Fig. 8.

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APPARATUS FOR SUPPORTING MINE BRATTICES

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4 Claims. (Cl. 98—50)

This invention relates to a method and apparatus for supporting mine brattices and more particularly to a method and apparatus for rapidly positioning and removing mine brattices.

In underground mines brattice cloth stoppings are used to deflect air currents and direct the flow of air to working areas of the mine for most efficient ventilation. The brattice cloth stoppings, sometimes referred to as mine brattices, are curtain-like barriers that are secured to the mine wall or roof and serve as a barrier to close openings such as lateral passageways or the like and to thereby channel the ventilating air circulating throughout the mine along preselected paths.

The present procedure for hanging mine brattices from the wall or roof of a mine is to overlap an edge portion of the brattice cloth and drive a triangular spad through the brattice cloth into the wall or roof. The spad has an aperture adjacent its base and a nail or the like is inserted into the aperture to serve as an engaging means for the brattice cloth. To remove the mine brattice from the roof or wall a workman first removes the nail or other key member extending through the aperture in the spad and then pulls the brattice cloth over the base end portion of the spad. The present procedure for both positioning and removing the brattice cloth from the mine roof or wall is time consuming and involves a substantial amount of labor. Frequently the roof of the mine is at elevations beyond the reach of an ordinary workman and special equipment such as a ladder or platform is required to both hang the brattice cloth from the roof and also to remove the brattice cloth from its hanging position.

The presently used procedure is to pierce an overlapped portion of the brattice cloth with a mine spad that is positioned in a spad gun similar to that disclosed in U.S. Patent #2,701,359. The spad gun is then used as an extension of the workman's arm and serves to start the spad into the mine roof. The spad gun has a hammer portion that drives the spad into the slate or coal a sufficient distance to firmly secure the mine spad therein. After the spad is imbedded in the roof it is necessary for the workman to stand on either a platform or a ladder and insert the nail or other key member into the aperture in the spad to engage the brattice cloth and prevent the tear in the brattice cloth made by the spad from enlarging to an extent that the brattice cloth slides over the base of the spad and is disengaged therefrom. Usually a plurality of spads spaced at a preselected distance are required to hang a mine brattice across an opening or passageway within the mine. This requires the workman to sequentially move the platform or ladder along the mine brattice to insert the nails or other key members in the spad aperture. Frequently other workmen are required to hold the brattice cloth in position across the opening while the spads are being driven through the brattice cloth into the mine roof.

The mine brattices are presently being removed from a hanging position by having a workman remove the key or nail members from the apertures in the spads and then the brattice is disengaged from the spads by a downward pull on the brattice to enlarge the tear in the overlapped portion of the brattice cloth.

With the herein described invention the heretofore described, presently used method for hanging and removing mine brattices is greatly simplified. It is no longer necessary for the workman to use a platform or ladder to position a nail or other key member in the spad apertures. The brattice cloth is secured to the mine roof or wall by driving the spad through the brattice cloth and into the mine roof. The brattice cloth may be rapidly removed or taken down by exerting downward pull thereon because the key or nail does not extend through the aperture in the spads.

In U.S. Patent #2,395,689 entitled, "Means for Supporting Mine Brattices," there is disclosed a method and apparatus for securing mine brattices to the mine roof. In FIGURES 3 and 4 there are illustrated the retaining key members which extend through the apertures in the spad base portion. FIGURE 7 illustrates a modified spad that has an extension therefrom adjacent the base for hanging the brattice cloth thereon. A spad such as that illustrated in FIGURE 7 cannot be used with the spad gun disclosed in U.S. Patent #2,701,359. FIGURES 5 and 6 illustrate a plate that is positioned on a spad and has a rebent hooked portion to which the lapped portion of the mine brattice is secured. The hooked end portion of the plate does not permit use of the spad gun disclosed in Patent #2,701,359 and the plate must have sufficient rigidity in the hooked end portion to support the brattice cloth so that removal of the plate by pulling on the brattice cloth is not feasible.

Briefly the herein described invention is directed to an improved method and apparatus for securing mine brattices to a mine wall or roof and includes a stop member positioned on the mine spad adjacent the tip of the spad positioned in the spad gun. The front edge of the spad then pierces the lapped portion of the brattice cloth and is driven into the mine roof. The stop member progresses down the body of the spad as the spad is driven into the mine roof and remains in abutting relation with the lapped portion of the brattice cloth to fixedly secure the brattice cloth to the mine roof. When it is desired to remove a hanging brattice cloth secured to the roof, a downward pull on the brattice cloth of a preselected force will enlarge the aperture in the stop member and the stop member progresses downwardly on the spad over the base end portion to thereby disengage the brattice cloth from the spads.

Accordingly the principal object of this invention is to provide a method of assembling mine brattices that does not require the positioning of retaining key members and the like in the spad aperture.

Another object of this invention is to provide a stop member that is positioned on the spad adjacent the tip of the spad and is moved longitudinally on the spad as the spad is driven into the mine roof.

Another object of this invention is to provide a stop member for mine brattices that may be removed from the mine spad by a downward pull of sufficient force on the brattice cloth.

These and other objects and advantages of this invention will be more completely disclosed and described in the following specification, the accompanying drawings and the appended claims.

In the drawings:

FIGURE 1 is a fragmentary cross sectional view in side elevation of a mine brattice secured in a mine roof.

FIGURE 2 is a cross sectional view in front elevation of the same.

FIGURE 3 is a view in side elevation of mine spad with the stop member positioned thereon.

FIGURE 4 is a view in top plan of the stop member.

FIGURE 5 is a view in side elevation of the member illustrated in FIGURES 1–4.

FIGURE 6 is a fragmentary view of a mine brattice with metallic grommets positioned therein.

FIGURE 7 is a view similar to FIGURE 1 illustrating

the manner in which the mine spad with the stop member secures a mine brattice with grommets to the mine roof.

FIGURE 8 is a view taken along the line 8—8 in FIGURE 7.

Referring to the drawings there is illustrated a spad generally designated by the numeral **10** that is stamped or formed from a metal sheet having a predetermined thickness and has a triangular configuration in plan with a pointed front end portion **12** and a base portion **14**. The side walls **16** and **18** converge toward the end portion **12** to provide the generally triangular configuration. There is provided an aperture **20** in the spad body portion adjacent the base **14**. The spad **10** is arranged to be positioned in a receiving slot in a spad gun similar to that illustrated in Patent No. 2,701,359. The spad gun has a hammer member that exerts a driving force against the spad base portion **14** to imbed the spad in the slate or coal. Generally, to provide sufficient engagement between the spad **10** and the coal or slate designated by the numeral **22**, the spad is usually driven a distance ⅔ or more of its length into the coal or slate.

Positioned on the spad **10** is a stop member generally designated by the numeral **24**. The stop member **24** is cup shaped with a bottom wall **26** and an annularly extending side wall **28**. The bottom wall **26** has a circular aperture therethrough which has a diametrical dimension substantially equal to the dimension between the side walls **16** and **18** of spad **10** at aproximately one-third the distance from the spad tip **12**, as illustrated in FIGURE 3.

The stop member **24** and spad **10** are used to install the brattice cloth in the following manner. The spad **10** has a stop member **24** positioned thereon, as illustrated in FIGURE 3. The spad **10** is then positioned in a spad gun similar to that described in U.S. Patent #2,701,359 and the stop member **24** is so dimensioned that it serves as a centering device for the spad **10** within the spad gun. The brattice cloth generally designated by the numeral **30** has an overlapped end portion **32** which is positioned in abutting relation with a mine roof **34** adjacent one end of the passageway which is to be closed by the brattice cloth **30**. The tip of the spad pierces the overlapped portion of the brattice cloth **32** as illustrated in FIGURES 1 and 2 and is imbedded in the coal or slate **22** by the hammer action of the spad gun. As the spad **10** advances into the coal or slate **22** the stop member **24** progresses downwardly on the spad **10** and the aperture **30** in the stop member base portion **26** is elongated by the spad inclined side walls **16** and **18**. As the aperture **26** is elongated or enlarged an upwardly forcing lip **33** is extruded adjacent the aperture **26**. The stop member **24** attains the position illustrated in FIGURE 1 when the spad **10** is imbedded in the coal or slate **22** at the desired depth of penetration and the extruded lip portion **33** of the stop member bottom wall **26** is in abutting relation with the underside of the brattice cloth overlapped portion **32** to maintain the brattice cloth **31** in the desired hanging position. Thus, with the stop member **24** it is now possible to hang the brattice cloth **31** across mine passageways without positioning a key or pin member through the spad aperture **30**. This eliminates under average conditions the necessity of a platform or ladder and also eliminates under all conditions the separate operation of installing the key members. The stop member is made from any suitable material such as a light gauge steel or plastic that has the required strength to support the brattice cloth in a hanging position and yet is readily deformable to expand the aperture **30** while inserting the spad **10** in the coal or slate **22**. The stop member **24** should, however, be fabricated from a material that has sufficient strength to hold the brattice cloth in a hanging position and thereafter may be removed from the spad **10** by a downward force on the brattice cloth **31**.

To remove the hanging brattice cloth, a downward force of sufficient magnitude is exerted on the brattice cloth **31** and the already elongated aperture **30** is further expanded to strip the stop member **24** from the spad **10** so that the stop member **24** will move over the spad base portion **14** and disengage the brattice cloth **31** therefrom.

FIGURES 6, 7 and 8 illustrate a brattice cloth **36** that has a plurality of metallic grommets **38** positioned therein adjacent the upper edge portion **40**. To hang the brattice cloth **36** having grommets **38** to the mine roof **34**, the spad **10** with the stop member **24** positioned thereon as illustrated in FIGURE 3 is inserted through the aperture in the grommet **38** and imbedded in the coal or slate **22** in a manner similar to that previously described in respect to FIGURES 1 and 2. The extruded portion of stop member base **26** abuts the grommet **38** and maintains the brattice cloth **36** in a hanging position. To remove the brattice cloth **36**, a downward pull or jerk sufficient magnitude is exerted thereon until the stop member **24** is stripped over the spad base portion **14**. The distance between the spad side walls **16** and **18** adjacent the base **14** is less than the dimension of the aperture in the grommet **38** so that the grommet will pass over the spad **10** and disengage the brattice cloth therefrom.

According to the provisions of the patent statutes, I have explained the principle, preferred construction, and mode of operation of my invention and have illustrated and described what I now consider to represent its best embodiment. However, I desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. Apparatus for hanging brattice cloth from a surface of a mine at a location above the mine floor comprising,

a triangular wedge shaped spad having a pointed front edge, inclined side walls diverging from said front edge and terminating in a base portion, said spad arranged to penetrate a rock-like surface of a mine a preselected distance and suspend a portion of a brattice cloth therefrom,

a stop member having an aperture therethrough with a dimension less than the dimension of said spad base portion,

said spad extending through said aperture with said stop member engaging said spad side walls at a location between said spad front edge portion and said spad base portion, said spad inclined side walls supporting said stop member thereon,

said stop member arranged to support a portion of said brattice cloth pierced by said spad member and positioned on said pad member between said rock-like surface and said stop member, the weight of said hanging brattice cloth supported by said stop member, and

said stop member fabricated from a deformable material and being detachably mounted so that a pulling force of a preselected magnitude exerted on said stop member by said portion of said brattice cloth pierced by said spad member and positioned on said spad member between said rock-like surface and said stop member enlarges said apertures in said stop member to a dimension greater than the dimension of said spad base portion to thereby disengage said stop member and said brattice cloth from said spad.

2. Apparatus for hanging brattice cloth from a surface of a mine at a location above the floor comprising,

a plate-like spad having a triangular wedge shape with a pointed front edge, inclined side walls diverging from said front edge and terminating in a base portion, said spad arranged to penetrate a rock-like surface of a mine a preselected distance and suspend a portion of a brattice cloth therefrom,

a stop member having a body portion with a downturned edge portion, said body portion having a central aperture with a major dimension less than the dimension of said spad base portion, said stop member downturned edge portion arranged to center said

spad in a receiver of a tool arranged to drive said spad into said rock-like surface,

said spad extending through said aperture with said stop member engaging said spad side walls at a location between said spad front edge portion and said spad base portion, said spad inclined side walls supporting said stop member thereon,

said stop member arranged to support a portion of said brattice cloth pierced by said spad member and positioned on said spad member between said rock-like surface and said stop member, the weight of said hanging brattice cloth supported by said stop member, and

said stop member fabricated from a deformable material and being detachably mounted so that a pulling force of a preselected magnitude exerted on said stop member by said portion of said brattice cloth pierced by said spad member and positioned on said spad member between said rock-like surface and said stop member enlarges said aperture in said stop member to a dimension greater than the dimension of said spad base portion to thereby disengage said stop member and said brattice cloth from said spad.

3. Apparatus for hanging brattice cloth from a surface of a mine at a location above the mine floor comprising,

a plate-like spad having a triangular wedge shape with a pointed front edge, inclined side walls diverging from said front edge and terminating in a base portion, said spad arranged to penetrate a rock-like surface of a mine a preselected distance and suspend a portion of the brattice cloth therefrom,

a stop member having a body portion with an aperture therethrough, said aperture having a major dimension less than the dimension of said spad base portion, said spad extending through said aperture with said aperture side walls engaging said spad side walls at a location adjacent to said spad front edge portion,

said spad inclined side walls operable to enlarge said aperture and extrude portions of said stop member body portion adjacent to said aperture and form an upwardly extending lip portion,

said stop member arranged to support a portion of said brattice cloth pierced by said spad member and positioned on said spad member between said rock-like surface and said stop member, said stop member upwardly extending lip abutting said brattice cloth, the weight of said hanging brattice cloth supported by said stop member, and

said stop member fabricated from a deformable material and being detachably mounted so that a pulling force of a preselected magnitude exerted on said stop member by said portion of said brattice cloth pierced by said spad member and positioned on said spad member between said rock-like surface and said stop member enlarges said aperture in said stop member to a dimension greater than the dimension of said spad base portion to thereby disengage said stop member and said brattice cloth from said spad.

4. Apparatus for hanging brattice cloth having annular metallic grommet portions therein from a surface of a mine at a location above the mine floor comprising,

a plate-like spad having a triangular wedge shape with a pointed front edge, inclined side walls diverging from said front edge and terminating in a base portion, said spad arranged to penetrate a rock-like surface of a mine a preselected distance and suspended portion of the brattice cloth therefrom,

a stop member having an aperture therethrough with a dimension less than the dimension of said spad base portion,

said spad base portion having a dimension less than the dimension of the aperture in the annular metallic grommet,

said spad extending through said aperture in said stop member and through said aperture in said grommet, said stop member engaging said spad side walls at a location between said spad front edge portion and said spad base portion,

said stop member arranged to abut a surface of said grommet through which said spad member extends and is imbedded in said rock-like surface and support the hanging weight of said brattice cloth,

said stop member fabricated from a deformable material and being detachably mounted so that a pulling force of a preselected magnitude exerted on said stop member by said grommet enlarges said aperture in said stop member to a dimension greater than the dimension of said spad base portion to thereby disengage said stop member from said spad and permit said grommet to pass over said spad base portion.

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