

Dec. 28, 1948.

H. C. HARDING

2,457,554

HELMET

Filed March 15, 1946

2 Sheets-Sheet 1

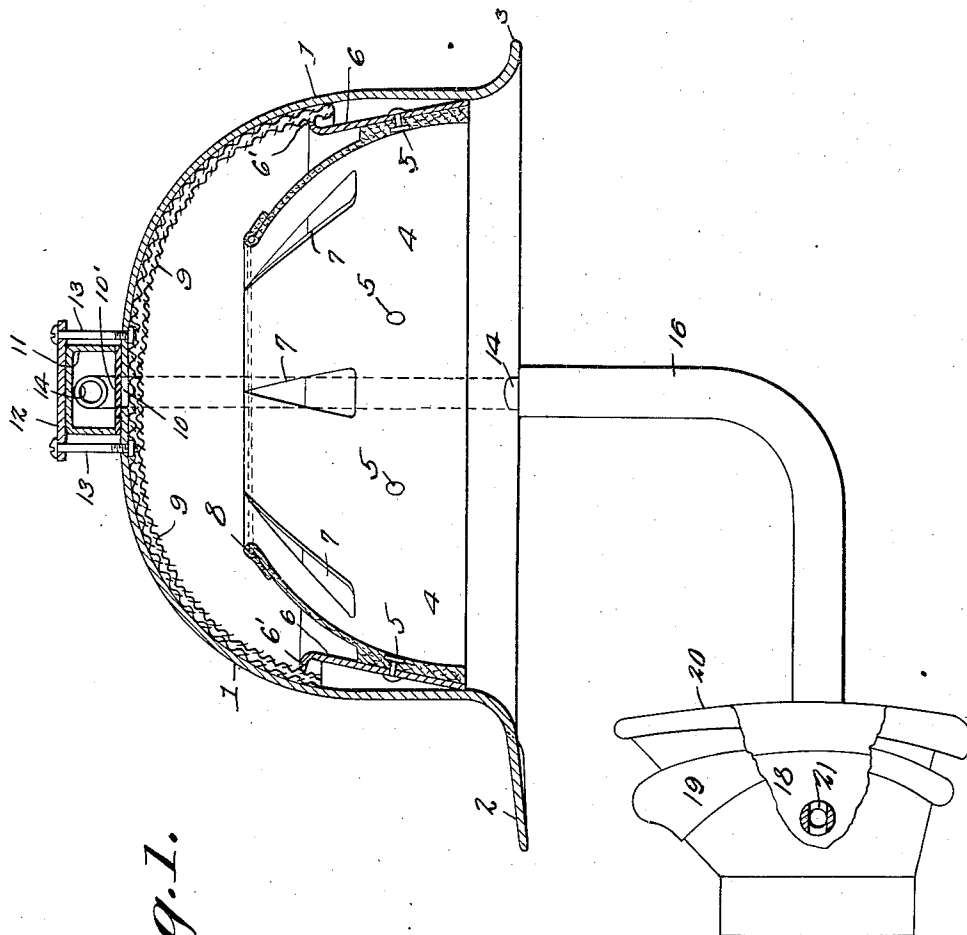


Fig. 1.

H. C. Harding

INVENTOR.

BY

BY *Abner*

ATTORNEYS.

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H. C. HARDING

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Fig. 3.

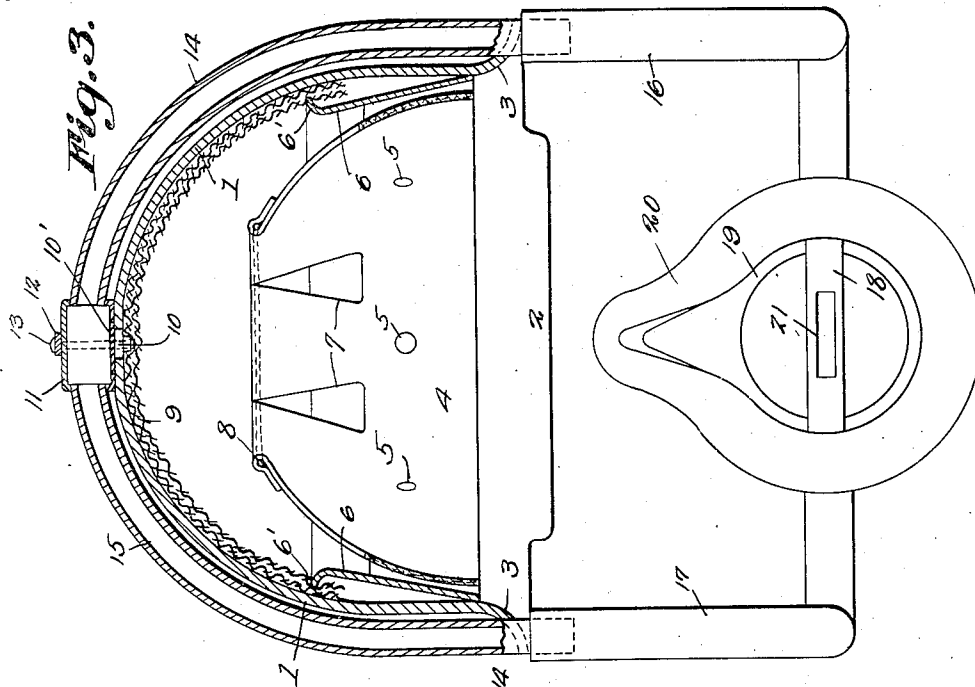
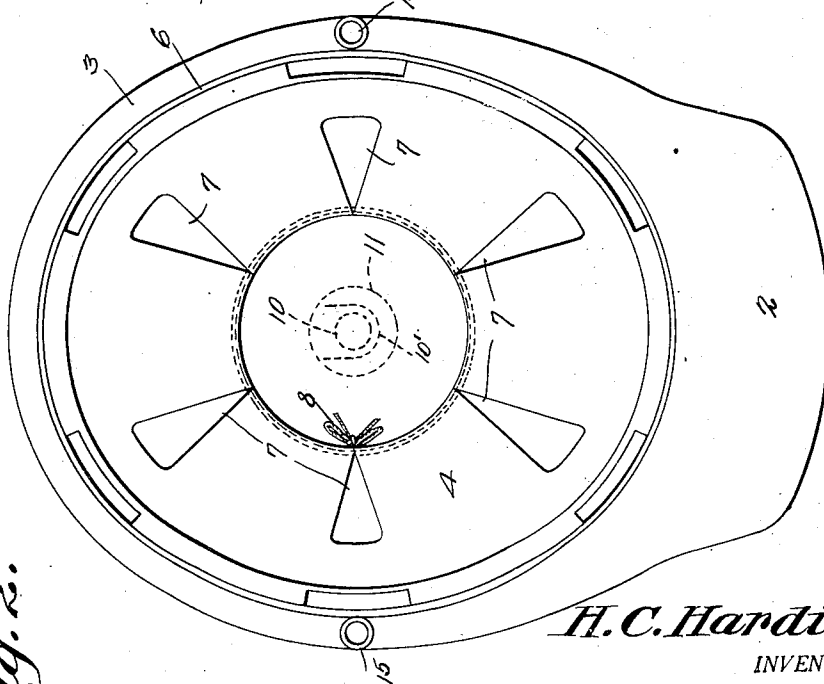


Fig. 2.



H. C. Harding
INVENTOR.

BY *CA Brownlee*
ATTORNEYS.

UNITED STATES PATENT OFFICE

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HELMET

Harry C. Harding, Trucksville, Pa.

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3 Claims. (Cl. 128-145)

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My present invention relates to an improved helmet and more particularly to the type of helmet worn by miners or other persons underground.

The principal object of my invention is to provide a helmet into which is incorporated means for filtering the air before it is breathed in by the user, and to provide adequate protection against silicosis and other respiratory diseases resulting from the inhalation of an excessive amount of dust or particles of the mined materials.

The helmet of my invention is particularly adapted for use by miners who require a minimum of equipment and a maximum of protection. By the use of my invention the separate filtering apparatus for the air is obviated and the helmet encloses all of the necessary structure with the exception of the mouthpiece.

The helmet and air filter of my invention is simple in construction, requires no moving parts and no replacement parts under normal usage. The filter element may be removed when necessary for replacement, or for cleaning as by shaking and/or washing. Otherwise the device will always be ready for use.

In the accompanying drawings I have illustrated one complete example of the physical embodiment of my invention according to the best mode I have thus far devised but it will be understood that changes and alterations in the exemplified structure may be made within the scope of the appended claims.

In the drawings:

Figure 1 is a longitudinal sectional view of the helmet and filtering apparatus.

Figure 2 is a bottom plan view of the helmet.

Figure 3 is a transverse sectional view of the helmet and filter.

Referring now to the drawings in detail, I have illustrated a helmet at 1 of conventional character and design, presently and preferably made of a light weight plastic, though other materials such as metal may be well employed.

The helmet 1 is fashioned with a forward visor 2, and an annular rim 3. The helmet and its integral visor and rim are normally a shell, substantially hemi-spherical in shape and designed to cover the head of the wearer from falling debris.

Within the helmet 1, I employ a normal support 4 for the helmet and designed to rest upon the head of the wearer. This support is normally of leather or other soft material and is attached by rivets 5 to an annular retaining ring

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6, preferably of thin, flexible metal, and having an outward flange 6'. The support 4 is formed with an upper drawstring 8 for adjustment, and the support also has therein air inlet openings 7. The support is spaced from the helmet and provides therebetween an air chamber.

On the inner side of the helmet 1 there is shown a filter 9 for the air comprising cloth of close weave and formed in layers. The lower end or marginal portion of the filter is held in close relation with the helmet by the outward flange 6' of the flexible ring 6 and when the ring is pressed into place in the helmet the flange abuts against the filter cloth and maintains it in position, thus defining a marginal seal between the filter and helmet.

Approximately central of the helmet I provide an air outlet port or opening 10 having valve 10'. Above the opening is a cup 11 secured in position over the opening by retaining bar 12 and bolts 13. Metal pipes, tubular in shape as 14 and 15 connect with the cup and extend downwardly on opposite sides of the exterior of the helmet.

Hose sections as 16 and 17 are connected respectively with the pipes 14 and 15, and these hose sections are attached to the ends of a tube 18 in the mouthpiece 19 of conventional form. This mouth piece is fashioned to cover the nose and mouth of the wearer and has a soft preferably sponge rubber cup 20 to snugly cover the nose and mouth.

The tube 18 in the mouth piece is formed with openings 21 therein communicating with the space interior of the mouth piece.

In operation, the helmet, formed according to my invention and having the mouth piece in position, is placed upon the head of the user. When the wearer inhales, air is drawn upwardly between the wearer's head and the support and through the openings 7 in the support. The air then passes through the filter 9 and out of the helmet through the opening 10. The air thus drawn divides and passes downwardly through the pipes and hose to the tube in the mouth piece from which it is drawn by the suction from the inhalation.

Thus with the device in use, all of the air is passed through the filter in the helmet, and as is obvious no separate filtering apparatus carried on the back or in the pocket is necessary.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The combination with a ported helmet hav-

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ing a removable interior support formed with air openings therein, of a filter removably insertable in the helmet in close relation thereto, an interior ring in the helmet connected to and surrounding the support and adapted, when inserted in the helmet, to press the filter against the helmet, said support and helmet forming a chamber the sole egress from which is through the helmet port, and communicating means between said port and a mouthpiece.

2. The combination with a helmet and a mouthpiece, said helmet having an air outlet port, of a removable filter means adapted to fit closely against the inner surface of the helmet and over the port, a removable interior support having air inlet openings, said support and helmet defining an air chamber, an interior ring connected to and surrounding the support, said ring being proportioned, when the support is inserted in the helmet, to wedge the support therein and to press the filter means against the helmet, whereby to provide a marginal seal for the air chamber, and means communicating between the port and mouthpiece.

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3. The combination with a helmet having an air outlet port, and with a mouthpiece, of a filter removably insertable against the inner surface of the helmet and overlying the port, an interior support, having air inlet openings, removably insertable in the helmet and defining in cooperation therewith an air chamber, a ring on the support, said ring being adapted to press the marginal portion of the filter tightly against the helmet, and means communicating between the outlet port and mouthpiece.

HARRY C. HARDING.

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