April 3, 1928. 1,664,646

F. A. SWEET

PORTABLE OVERCAST

Filed June 28, 1926 2 Sheets-Sheet 1

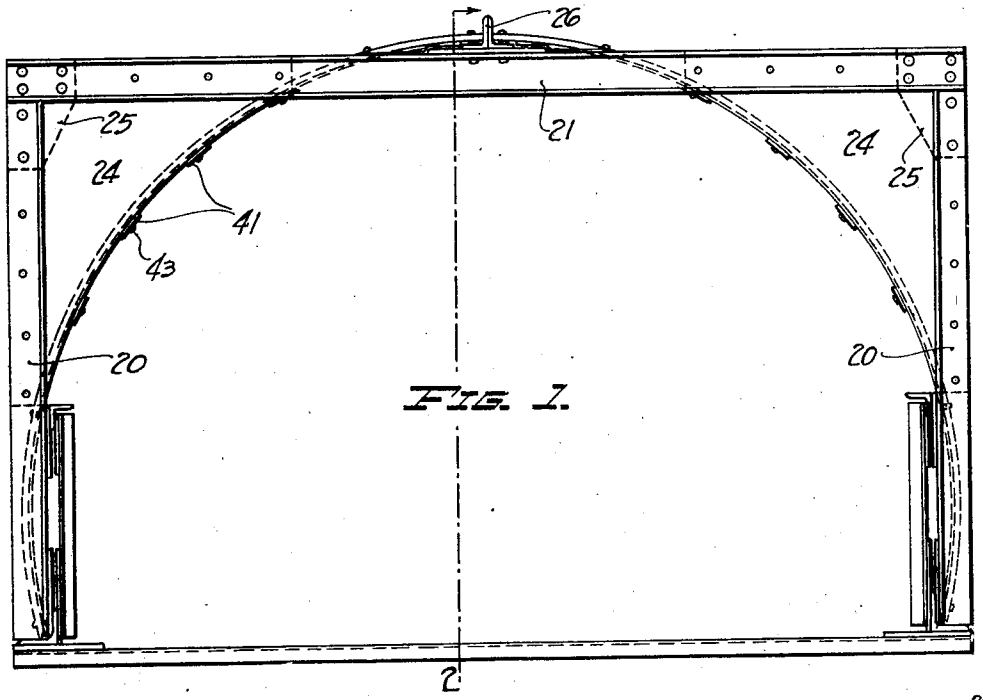


FIG. 1.

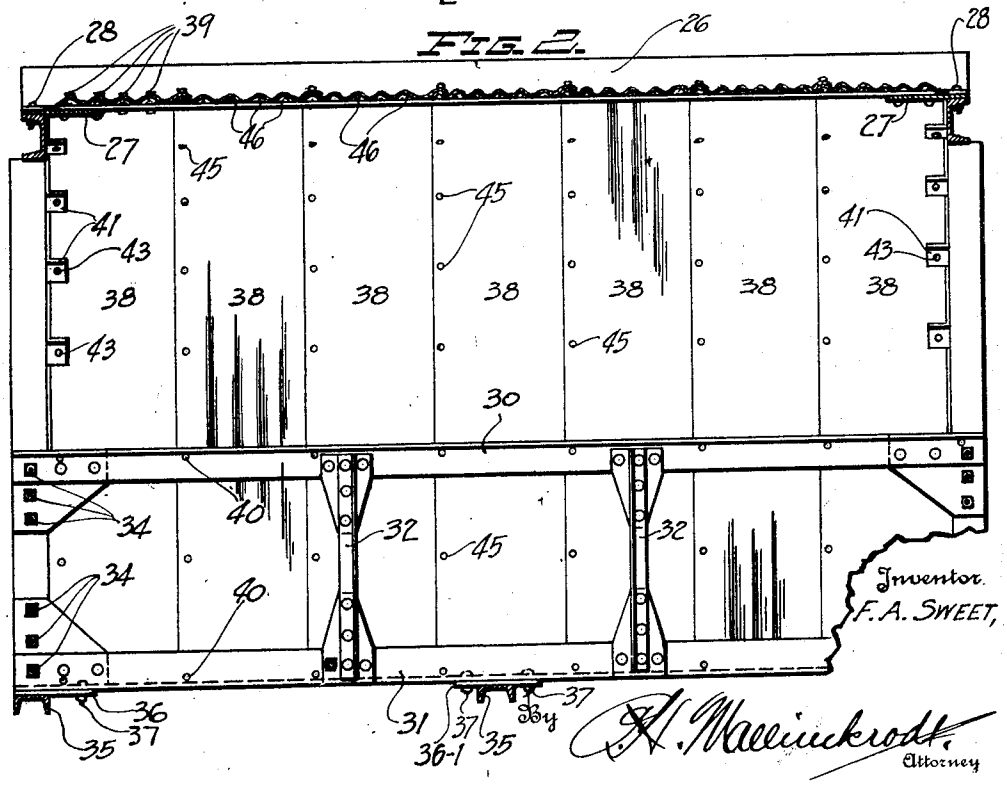


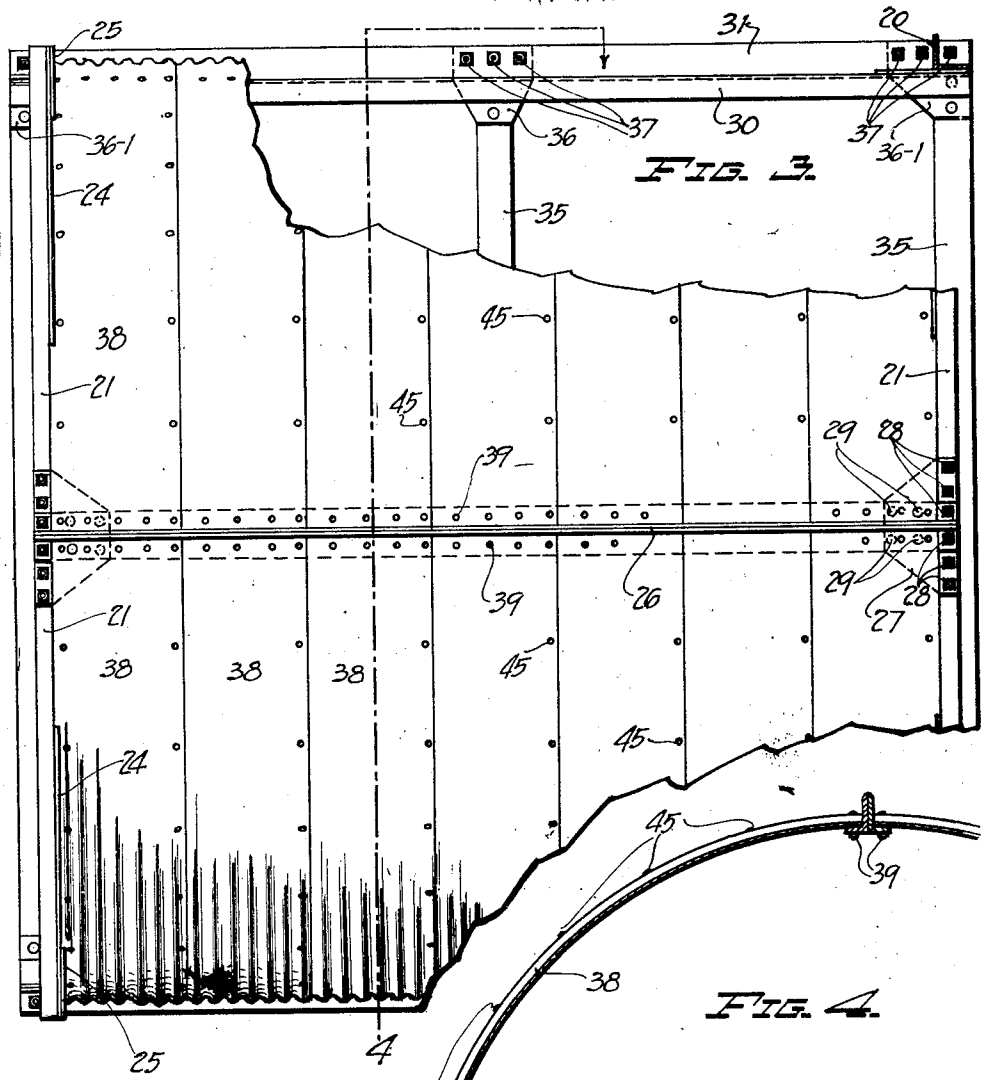
FIG. 2.

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PORTABLE OVERCAST

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UNITED STATES PATENT OFFICE.

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PORTABLE OVERCAST.

Application filed June 28, 1926. Serial No. 119,090.

This invention relates to a portable overcast for keeping air currents separated from each other at the intersections of passages in the underground workings of coal mines, metal mines, or in other similar locations.

The principal objects of this invention are:

First. To provide a portable overcast, so as to save time in erection, as well as cost in labor and material.

Second. A portable overcast which shall be comparatively light in weight though strong and durable.

Third. A portable overcast which shall be easily and quickly collapsed for transporting from point to point in restricted underground spaces, the overcast at the same time, being fire-proof.

Fourth. An overcast which shall eliminate the necessity for heavy permanent structures such as are usually built of concrete or stone.

In attaining the objects outlined, I provide a metal structure having an arched body portion, consisting preferably of galvanized corrugated steel plates, the corrugations of which follow the curvature of the arch. The arch is designed to conform in general, to the cross-sectional contour of the roof and walls of the air course into which it is to be placed, and the curved plates are detachably carried on a collapsible structure consisting of end portals connected to each other by a ridge member and side members as required. The sides of the structure may be held in spaced relation to each other by transverse floor members.

The arched plates are preferably made in two substantially similarly sets positioned on opposite sides of, and having their upper ends supported by the ridge member. From the ridge member, the plates extend downwardly, preferably over the outside of the side members, the latter being so placed that they shall support the lower portions of the plates against pressure from the outside.

The features of this invention for which the protection of Letters Patent is desired, are collectively grouped in the claims concluding this specification.

In the drawings, which illustrate merely one embodiment of this invention,

Fig. 1 represents an end elevation;

Fig. 2, a longitudinal section on line 2—2, Fig. 1;

Fig. 3, a top plan, a portion of the structure being broken away; and

Fig. 4, a cross-section on line 4—4, Fig. 3.

Referring to the drawings, each portal may consist of the side posts 20 and the upper chord 21, these being connected to each other by the comparatively light cover plates 24, forming corner brackets, reinforced by the heavier gusset plates 25. The ridge member 26 may consist of two steel angles placed back to back, and be connected at each end thereof to the transversely extending chords 21 of the portals, by means of the gusset plates 27 fastened with the removable bolts 28, the gusset plates being permanently fastened to the ridge member by the rivets 29.

The side longitudinal members which connect the lower ends of the portal posts to each other, may be made up of the top chord angles 30 and the bottom chord angles 31 united by the riveted cross members 32 to form frames. The chords are detachably fastened to the portal posts by means of the bolts 34. The side frames may be spaced apart from each other by the transverse floor members 35, the connections consisting of gusset plates 36 and 36^1, held by removable bolts 37.

The body of the structure consists of the curved corrugated steel sheets 38, which are fastened to the outstanding flanges of the ridge member by means of removable bolts 39, to the chords of the side members by means of removable bolts 40, and to each other by the removable bolts 45. The cover plates 24 may have the integral lugs 41, to which the adjoining body plates may be connected by removable bolts 43.

The arched and substantially transversely corrugated construction of the body plates gives great strength to resist the stresses of any material piled against or upon them, and is designed to guard against cave-ins that may proceed from the roof of a passage. In accomplishing this, it will be noticed that the portion of the cover plates between chord 30 and chord 31 of each side member, forms an arch to resist lateral stresses exerted against the sides of the overcast by material which may be piled against it. Any material which may fall from above is effectually resisted by the arched portions of the cover plates between chord 30 and the ridge member 26. Furthermore, the plates when loaded act as curved struts,

the end reactions of which find secure bearing against the outstanding legs of lower chord angles 31, and ridge angles 26.

The joints between the various members of the overcast may be made air-tight by means of oakum or other packing. In a similar manner, the spaces 46 formed on the under side of the cover plate due to the corrugations thereof, may also be made air-tight.

It will thus be evident that this overcast may be quickly erected and be made air-tight cheaply and effectively, also that it may be quickly taken apart and separated into pieces that are comparatively light in weight, therefore easily handle and transported.

An important feature of the present invention consists in the fact that the overcasts may be kept on hand ready for immediate use. This is especially valuable in the driving of entries in coal mines where gas is developed, and it becomes necessary to quickly establish the proper circulation of fresh air in order to reduce the hazards of explosion.

The overcast is also highly useful in mine accidents where entries and underground apparatus for ventilation is destroyed. In such cases, quick action is required to save life by restoring the circulation of air. This is effectively accomplished by means of this invention.

Although designed primarily to be portable, this overcast is practically indestructible and so combines permanency with portability, and may be left in place as long as desired, giving service equal to expensive stone or concrete structures.

The upper corner portions of the portals, braced by the cover plates 24, provide strength without obstructing the passage through the overcast.

While a specific embodiment of this invention is herein disclosed, it will be understood that various modifications could be made without departing from the spirit thereof.

Having fully described my invention, what I claim is:

1. A portable overcast comprising a collapsible framework having portal posts spaced apart from each other transversely and longitudinally, transverse chord members and longitudinal side members extending between said portal posts, a ridge member extending between said chord members, and arched body plates, detachably connected at their upper ends to said ridge member and at their lower ends to said longitudinal side members.

2. A portable overcast comprising arched body plates corrugated substantially in the direction of their curvature and a collapsible framework arranged to support said curved plates substantially in the form of an arched passageway.

3. A portable overcast comprising longitudinally extending side members, a longitudinally extending ridge member, means for supporting said members relatively to each other, and arched body plates extending from said side members to said ridge member.

4. An overcast comprising portal frames spaced apart from each other, longitudinal members having upper chords and lower angular chords connecting the said portal frames to each other, an angular ridge member, and arched body plates having end bearings against the outstanding legs of said angular lower chords and said angular ridge member.

5. A portable overcast comprising side members, ridge members, arched body members extending from said side members to said ridge members, and a plurality of floor members arranged to hold said side members in spaced relation to each other.

In testimony whereof I sign my name hereto.

FREDERICK A. SWEET.