J. S. BARTLETT.

MINING SYSTEM AND MEANS.

APPLICATION FILED NOV. 27, 1915.

1,233,301.

Patented July 17, 1917.

3 SHEETS—SHEET 1.

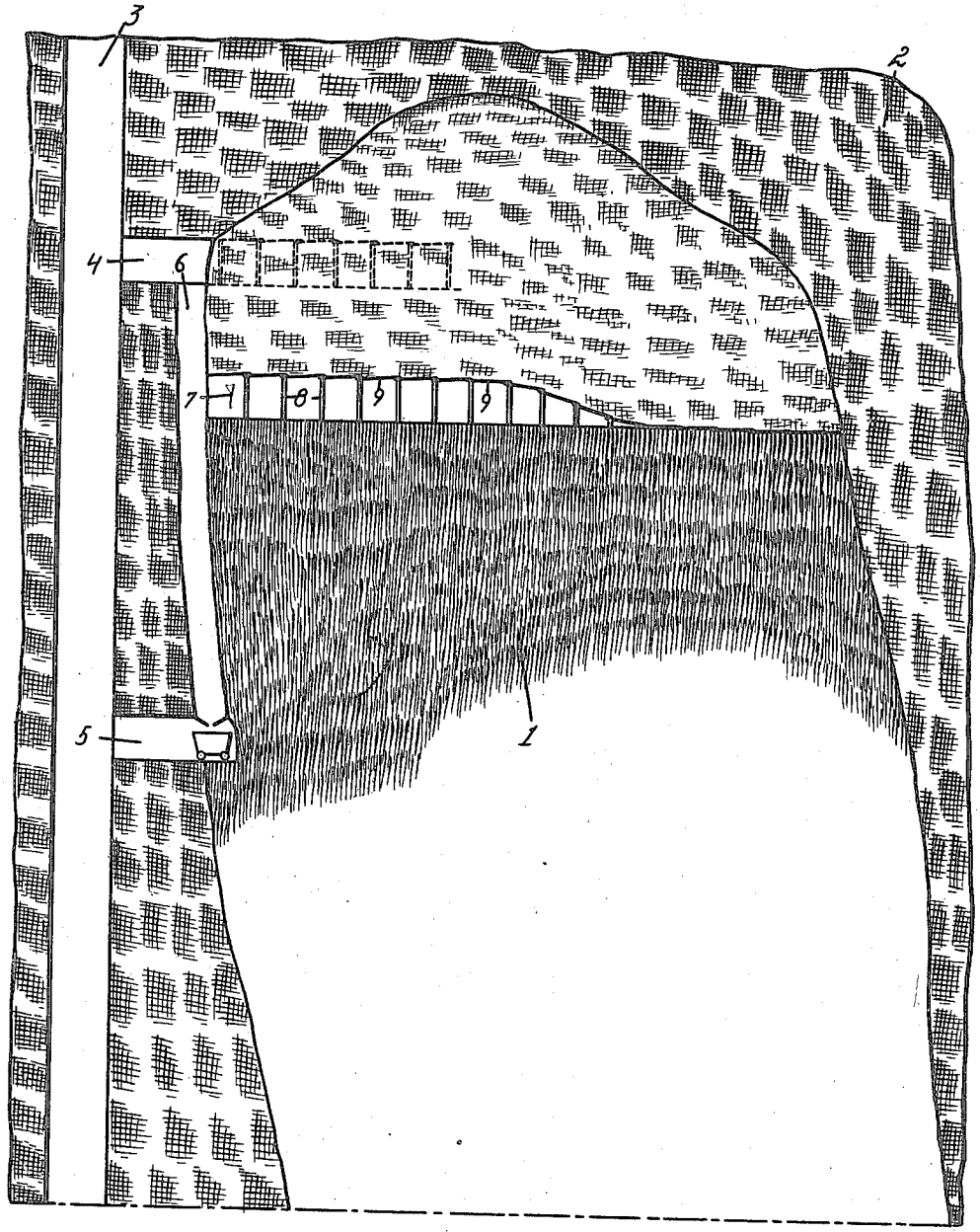


Fig. 1.

WITNESSES:

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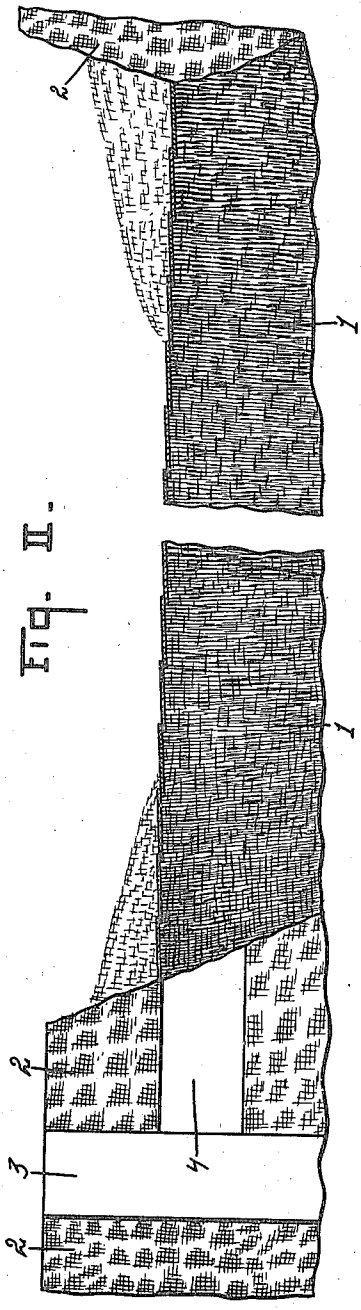


Fig. II.

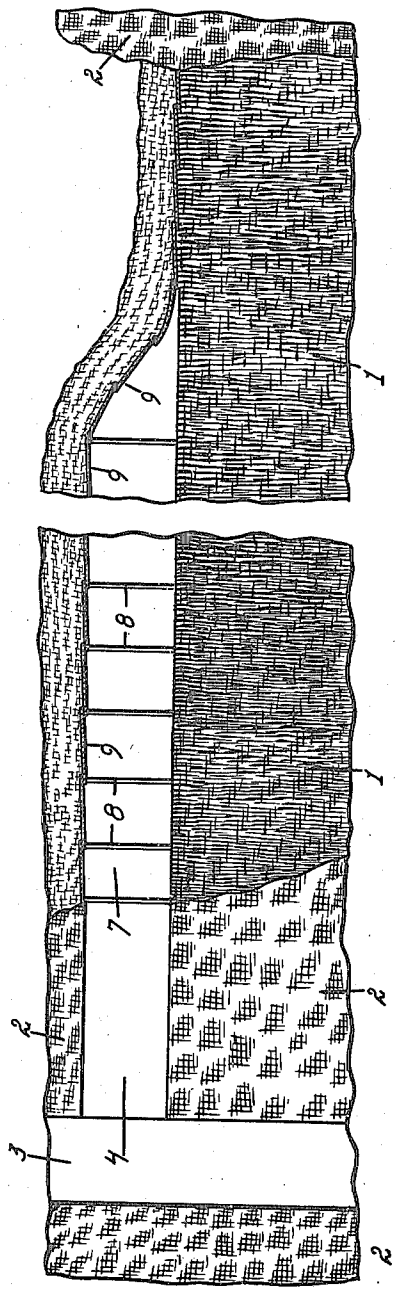


Fig. III.

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3 SHEETS—SHEET 3.

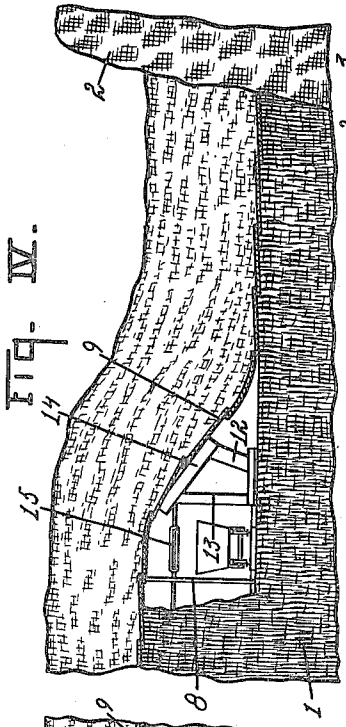


Fig. IV.

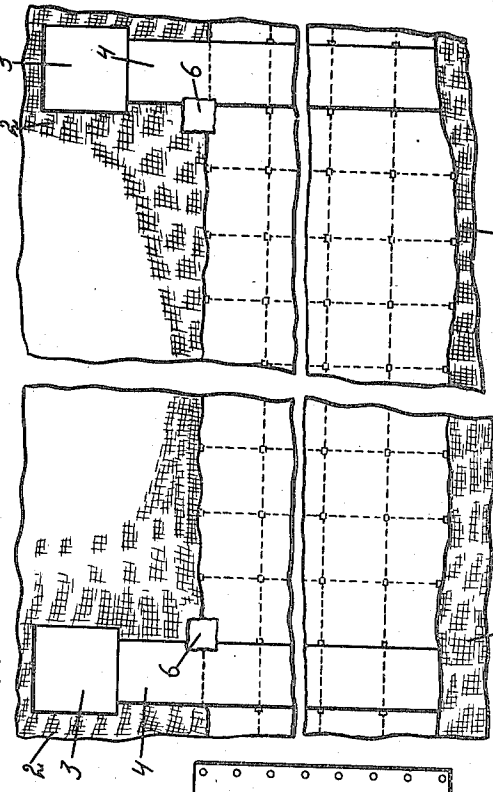


Fig. V.

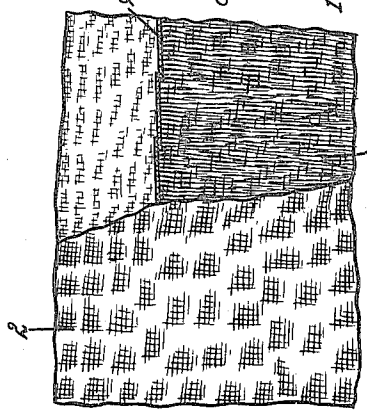


Fig. VII.

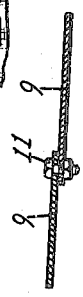


Fig. VIII.

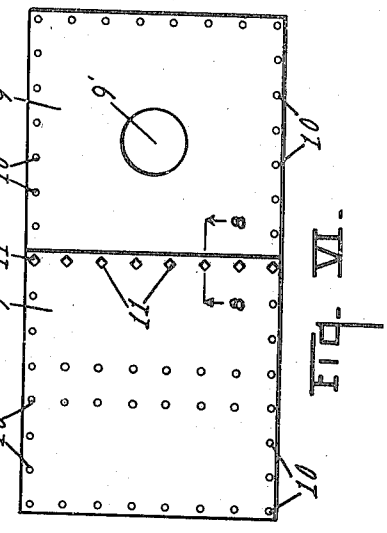


Fig. VI.

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UNITED STATES PATENT OFFICE.

JOHN S. BARTLETT, OF KALAMAZOO TOWNSHIP, KALAMAZOO COUNTY, MICHIGAN.

MINING SYSTEM AND MEANS.

1,233,301. Specification of Letters Patent. Patented July 17, 1917.

Application filed November 27, 1915. Serial No. 63,753.

To all whom it may concern:

Be it known that I, JOHN S. BARTLETT, a citizen of the United States, residing at Kalamazoo township, county of Kalamazoo, and State of Michigan, have invented certain new and useful Improvements in Mining Systems and Means, of which the following is a specification.

This invention relates to improvements in mining systems and means.

The objects of the invention are:

First, to provide improved means for the protection of the miner and the separation of the drift and debris from the ore while the same is being mined.

Second, to provide an improved roofing and separating means for separating the debris from the ore and protecting the miner while he is at work.

A detail object is to provide improved means for supporting a roof above the miner's head while he is at work and provide improved means of dropping the same to the top of the ore bed as the ore is being removed.

Further objects, and objects relating to details and economies of construction and operation will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification. The invention is clearly defined and pointed out in the claims.

An embodiment of the features of my invention and means for carrying it on are fully illustrated in the accompanying drawing, forming a part of this specification, in which:

Figure I represents a sectional view of a mine with my improved apparatus and method in operation.

Fig. II is a detail sectional elevation view of the upper portion of a mine where the ore bed has been uncovered by steam shovel or otherwise, and the top of the ore bed covered by my improved sheet metal plate structure.

Fig. III is a detail elevation view showing the manner in which the said plate structure is allowed to drop down onto the ore bed after the layer of ore has been mined away, by simply removing the timber posts.

Fig. IV is a detail view showing how the plate structure is allowed to descend or drop on to the top of the ore bed while the same is being mined, thus economizing in the use of timbers and post supports.

Fig. V is a broken plan view showing details of the arrangement of my improved plate structure within the mine, and the shafts and drifts thereto.

Fig. VI is a detail view of a pair of the plates which I make use of in this behalf showing how they are joined together.

Fig. VII is a detail of a half-size plate.

Fig. VIII is a detail sectional view taken on a line corresponding to line 8—8 of Fig. VI, showing the method of securing the edges of the plates together by bolts after they have been overlapped.

In the drawing, similar numerals of reference refer to similar parts throughout the several views.

The ore bed 1 is shown surrounded by the usual rock and earth 2, and shafts 3 are sunk down in proximity thereto, with drifts 4 and 5 leading therefrom. A pair of shafts 3 (see Fig. V) is usual practice. When the ore bed is struck by drifting from the shafts, I cut across the same, as at 7, placing a roof over the head of the miner, made up of plates 9, 9, the edges of which are perforated at 10 and lapped together and securely bolted by bolts 11, (see Fig. VIII) which are preferably heavy, strong machine bolts.

When the layer of ore has been completely removed, the roof of plates 9 is let down or permitted to drop by removing the posts 8, as indicated in Fig. I. Then the miner drifts across the vein opposite each shaft, placing posts beneath the vein, or as far as desired, preferably entirely across the vein. He then drifts laterally along the far wall of earth underneath the roof supporting the same until he can place a tram-car to run laterally from side to side at the rear of the vein. He then begins mining on the back side of the vein and permits the roof to drop down to the bottom of the cut after the manner indicated in Fig. IV, having movable supports consisting of posts 12 and 13 with suitable cap pieces 14 to retain the plate structure in position. There are, of course, some of the full height posts 8 at each end to be removed as the mining progresses to allow of the even descent of the plates. Jacks 15 are made use of to support and brace the roof structure.

When the entire layer of ore has been removed so that the roof is again dropped to

the lower level, it is drifted across opposite each shaft again and the posts set, and this process repeated.

When the vein of ore is uncovered and has been mined with steam shovels or otherwise from the top, so far as is expedient, I place my plates over the top of the vein and then drift from the shaft to begin mining as indicated in Fig. II, dropping down after the manner indicated in Fig. III. The ore of course can be discharged down the winze 6 at each side, to be taken out at the lower level in the car, as indicated in Fig. I.

In placing the plates and in order to prevent undue pressure on the same at any point, poles or other supports can be inserted above the same and the posts may be provided with cap means similar to the cap 14 seen in Fig. IV, such poles, posts and similar supports being the common expedient made use of in present methods of mining and not requiring particular illustration here, as they are made use of in very great variety and are common everyday expedients.

Holes 9′ are made through the plates 9 at intervals to permit access to the debris and rock above whenever the same may be desired. These may be provided with covers or not as circumstances may indicate.

From what I have said it is clear that my improved mining method can be greatly modified and the same can be used in various ways. The preferred method is, after the insertion of the plates, to drift across the same to the back side of the vein and then drift across the back, permitting the roof to descend as indicated in Fig. IV, and then repeat the operation in each layer. By this means, very little timber will be required for supports, as a comparatively narrow portion of this roof will need to be supported while mining is in progress. The miner will be safe at all times. These plates I prefer to make of steel as heavy as boiler plate and heavier under certain circumstances. They will be found to be sufficiently flexible for the purpose, owing to the great weights and pressures that come upon them, and they will at the same time be found to be sufficient to support the earth above and effectively protect the miner beneath.

When there is only a small amount of debris above the plates, it is entirely feasible to support the plates over the entire area by posts. However, such a course would result in the use of an undue amount of timber and when a considerable quantity of earth and debris had caved in on the top of the plates, it would be inexpedient to proceed in this way and the plates should be allowed to drop to the top of the vein behind the miner as the ore is removed, and in this way a minimum amount of timber and a consequent reduced cost of mining is obtained.

It will thus be seen that the present caving system of mining is improved in that the heavy expense of timbering is minimized and full working space for the miner is preserved and the miner himself is protected at all times from injury from an undue amount of caving and falling debris.

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

1. A mining method comprising the sinking of suitable shafts, driving suitable drifts therefrom, providing a continuous yieldable flexible roof support, removing ore from beneath the same, and releasing the said roof support thus allowing the roof to fall upon the ore beneath.

2. A mining method comprising the sinking of suitable shafts, driving suitable drifts therefrom, providing a continuous yieldable flexible roof support, removing ore from beneath the same beginning at one side or end, thereby releasing said support and allowing the roof support to flex and fall from side to side upon the ore beneath.

In witness whereof, I have hereunto set my hand and seal in the presence of two witnesses.

JOHN S. BARTLETT. [L. S.]

Witnesses:

LUELLA G. GREENFIELD,

MARGARET L. GLASGOW.