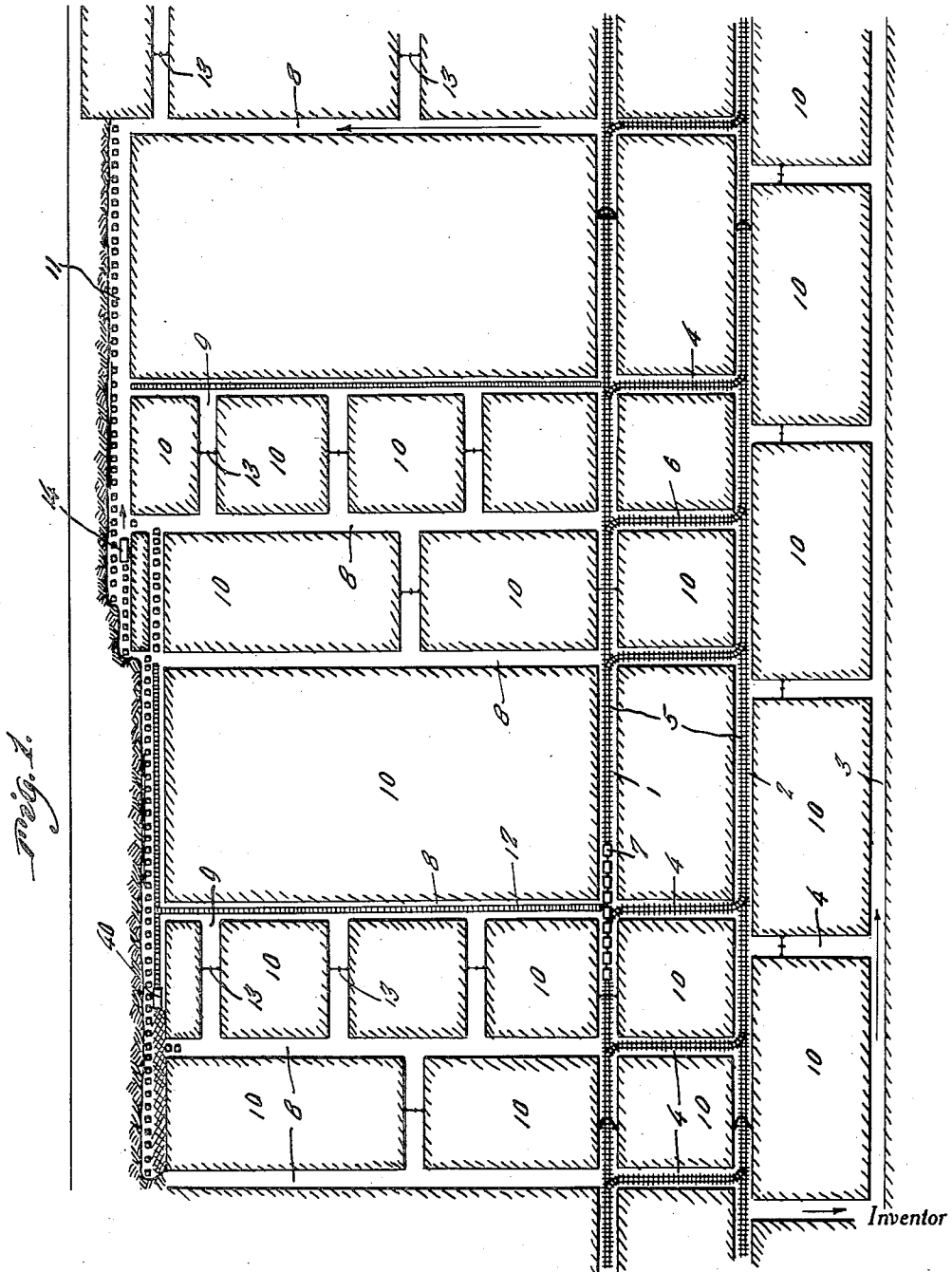
July 3, 1934. J. C. McDERMOTT 1,965,043

APPARATUS FOR MINING

Original Filed Aug. 3, 1931 4 Sheets-Sheet 1



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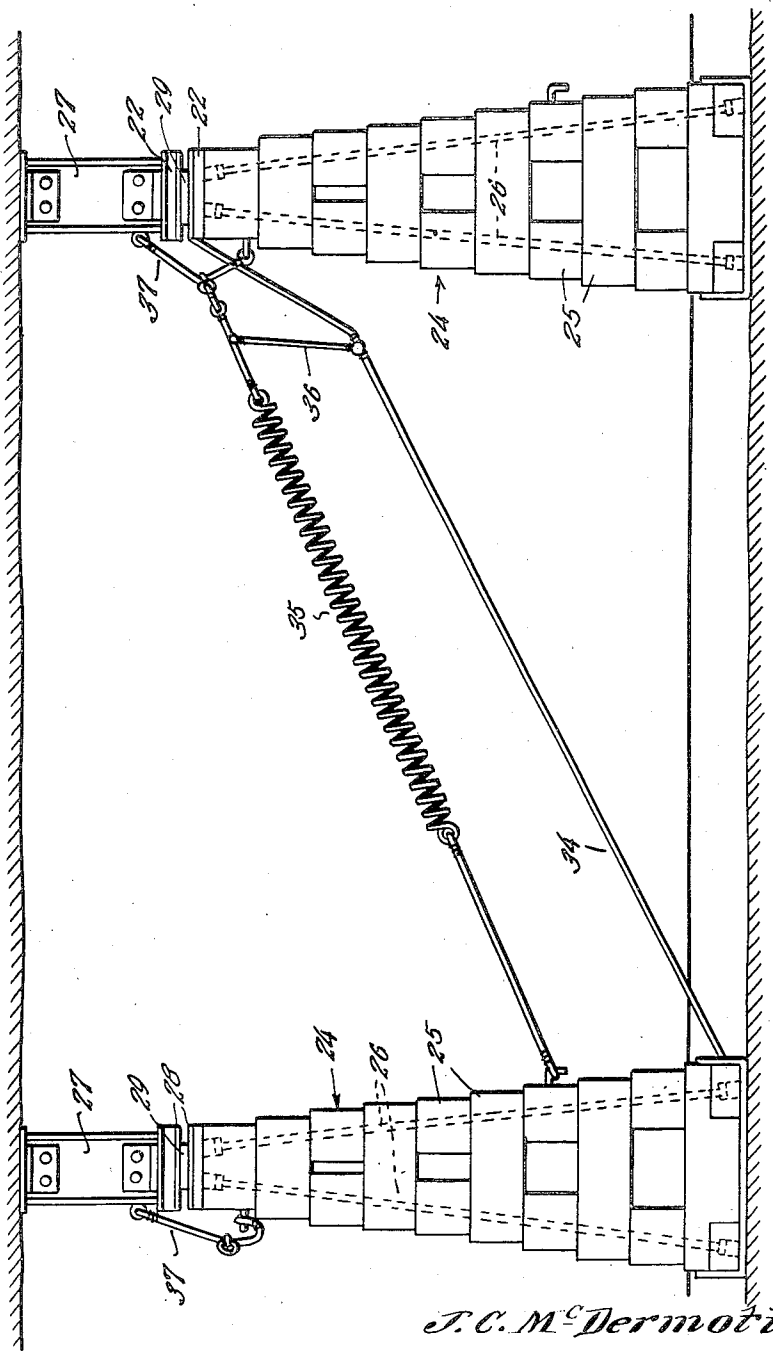


Fig. 2.

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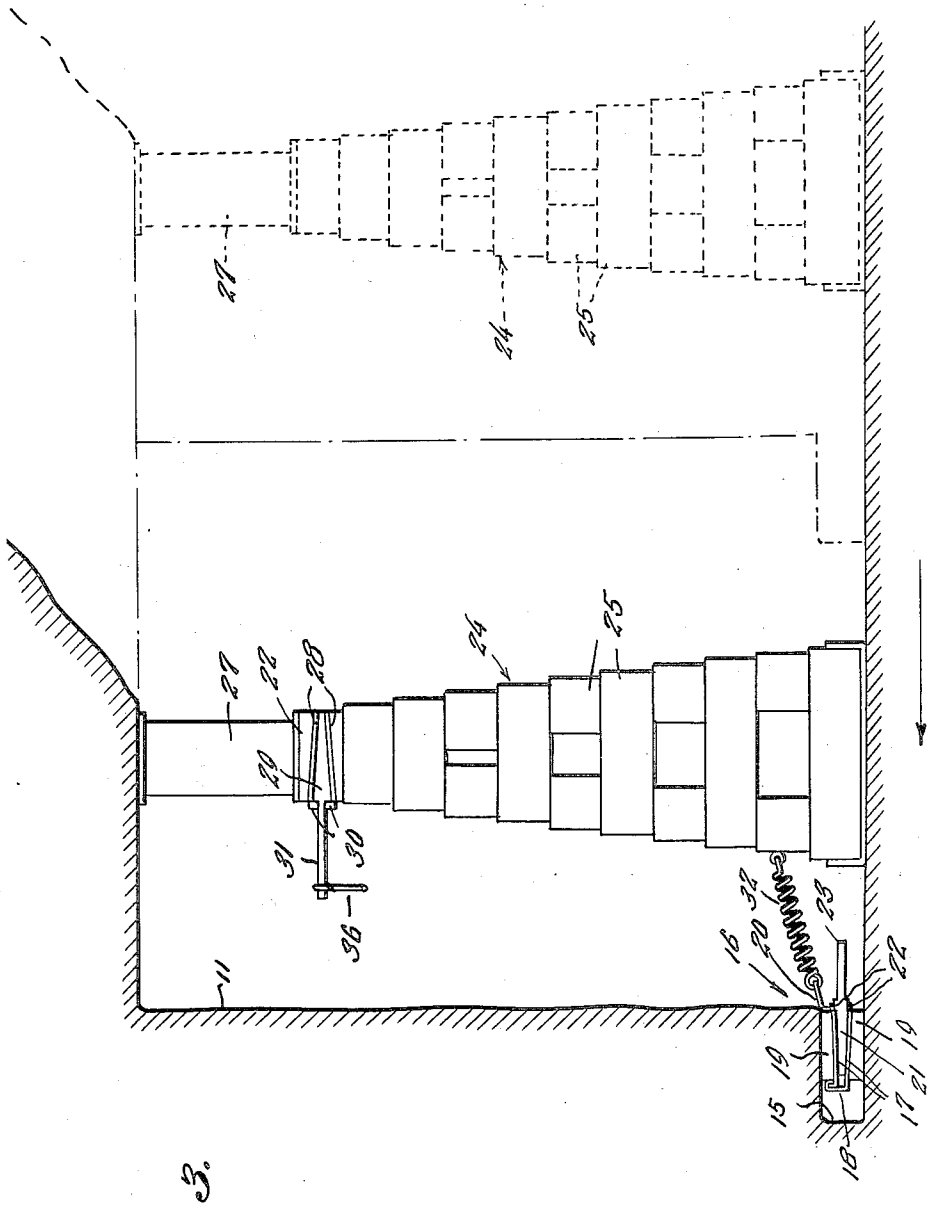


Fig. 3.

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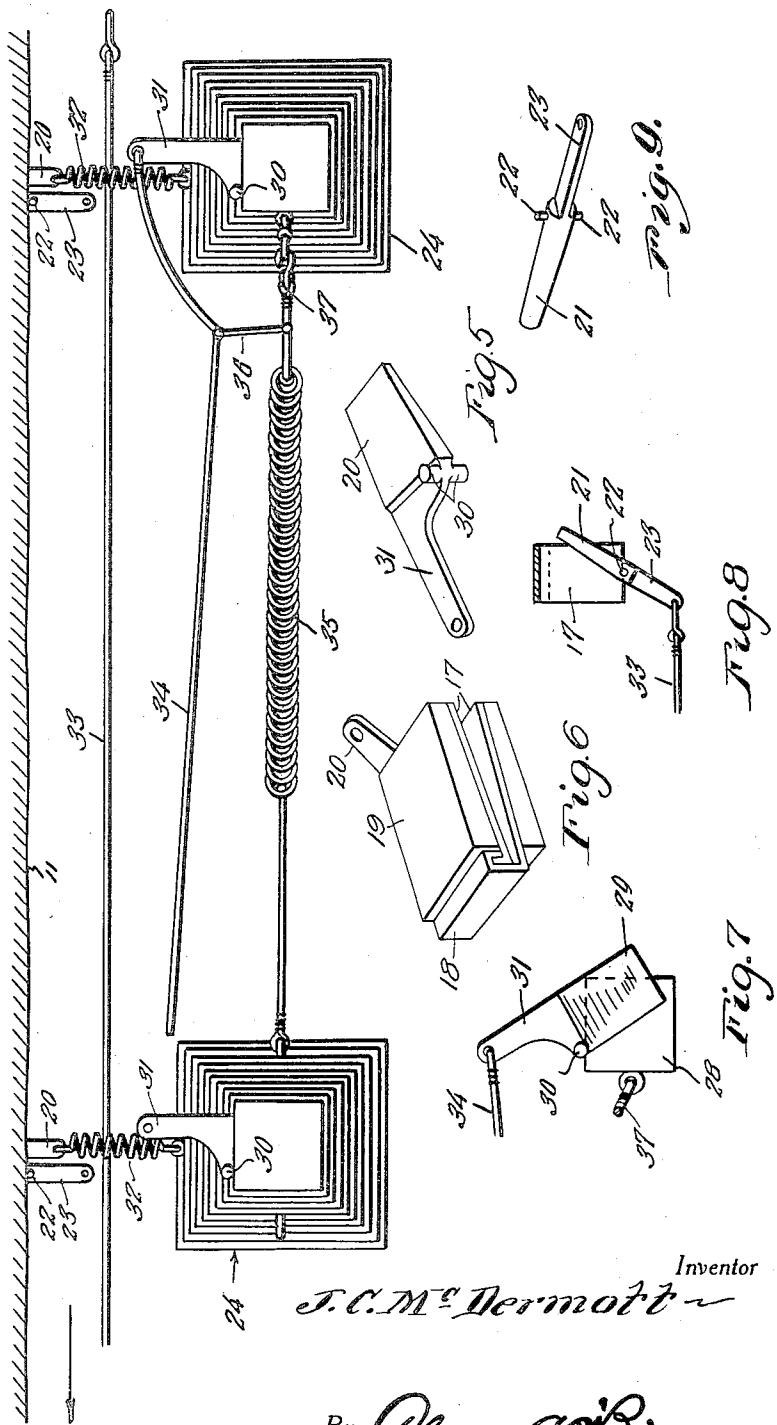


Fig. 4a.

Fig. 5

Fig. 6

Fig. 7

Fig. 8

Fig. 9

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1,965,043

APPARATUS FOR MINING

John C. McDermott, Indiana, Pa.; Mrs. G. Omer Graff executrix of said John C. McDermott, deceased

Application August 3, 1931, Serial No. 554,803
Renewed November 7, 1933

2 Claims. (Cl. 262—1)

The present invention relates to an apparatus for mining coal and has for its primary object to provide means whereby substantially all of the coal in the pillars or supports of the mine may be recovered.

The foregoing and still further objects and advantages of the invention will become apparent from a study of the following specification, taken in connection with the accompanying drawings wherein like characters of reference designate corresponding parts throughout the several views, and wherein:—

Figure 1 is a diagrammatic view of a section of a coal mine being worked with an apparatus in accordance with this invention.

Figure 2 is a view showing the arrangement of the previously and newly erected roof supporting chocks, one of which is ready to be withdrawn to permit the roof to fall.

Figure 3 is a view substantially similar to Figuse 2 but showing the roof of the mine after one of the chocks shown in said Figure 2 has been withdrawn.

Figure 4 is a view in top plan showing a pair of the roof supporting chocks.

Figure 5 is a detail view in perspective of the removable wedge which is used with each roof supporting chock.

Figure 6 is a detail view in perspective through the interlocked blocks forming important portions of the sprags which are inserted in the kerf.

Figure 7 is a view in top plan showing one of the wedges illustrated in Figure 5 partially removed from the chock.

Figure 8 is a detail view in horizontal cross section through one of the sprags.

Figure 9 is a detail view in perspective of the sprag wedge.

Referring now to the drawings in detail, it will be seen that the reference numerals 1, 2 and 3 designate mine entries which are connected by cut throughs 4. The reference numeral 5 designates tracks in the entries 1 and 2, said tracks being connected, as at 6. A train of cars is designated by the reference numeral 7. The reference numeral 8 designates rooms in the mines which are connected by cut throughs 9, forming pillars 10. The face of the mine is indicated at 11. A conveyor is indicated at 12 in Figure 1 of the drawings. Then, the reference numeral 13 designates brattices in certain of the cut throughs. A conventional cutting machine is indicated at 14, said machine functioning to cut a kerf 15 in the face 11 of the mine.

The apparatus constituting the present invention comprises a plurality of sprags which are designated generally by the reference numeral 16, said sprags being insertable in the kerf 15. Each sprag includes a pair of metallic plates 17 hingedly connected, as at 18, at the end which is disposed innermost in the kerf and having fixed on the upper and lower sides thereof blocks 19 from the uppermost of which an apertured arm 20 projects. The plates 17 are adapted to receive therebetween a wedge 21 having on its large end portion fulcrums 22. An arm 23 projects longitudinally from the outer end of the wedge 21.

As the cutting of the kerf 15 progresses, chocks designated generally by the reference numeral 24 are erected in a row adjacent the face for supporting the roof of the mine. The chocks 24 each comprise the build-up blocks 25 connected to each other by the rods 26 having headed ends countersunk in the uppermost and lowermost blocks. The chocks 24 further include the roof engaging portions 27 which may be in the form of H beams. Disposed between the members 27 and the uppermost blocks 25 are the inclined plates 28 on the opposed sides of the blocks 29. The plates 28 are adapted to receive therebetween the wedges 29 having thereon the fulcrums 30 which are operatively engageable with the adjacent edges of the plates 28. This is illustrated to advantage in Figure 7 of the drawings. The wedges 29 further include the arms 31 projecting longitudinally from one side portion thereof. The sprags 16 and the chocks 24 are spaced as may be desirable or necessary according to the nature of the vein being worked. The sprags 16 are connected to an adjacent chock 24 by the coil springs 32, said coil springs being normally under tension when connected to the sprags and chocks.

As the cutting of the kerf 15 progresses and the sprags 16 are inserted, a chain or cable 33 is disposed on the floor of the mine adjacent the face and is connected to the arms 23 of the wedges 21 of the sprags. Then, when the kerf 15 has been completed and the row of chocks 24 erected adjacent the face, the cable or chain 33 is connected to the cutting machine 14 and the wedges 21 are pulled or withdrawn. The plates 17 with the blocks 19 thereon are withdrawn from the kerf by the coil springs 32 and the coal above the kerf falls. The loose coal is then loaded out of the mine. Usually the coal will fall by gravity when the sprags are removed but it may sometimes be necessary to resort to blasting to cause the coal to fall.

After the coal which has fallen has been loaded out, the cutting machine 14 is again brought into the face and the cutting of a new kerf is begun. The sprags 16 are inserted in the new kerf in the same manner as hereinbefore described and a new row of chocks 24 is begun. After several of the chocks 24 of the new row have been erected, for example three, the removal of the chocks constituting the previously erected row is begun for per-

mitting that portion of the roof of the mine to fall. This is accomplished by connecting a cable or chain 34 from the machine 14 to the arm 31 of the wedge 29 of the chock 24 of said previously erected row which is farthest from the machine 14. This would probably be the chock of the previously erected row which is closest to the chock which was erected first in the new row. A coil spring 35 connects the chock which is to be removed with an adjacent chock. The cable or chain 34 is connected with the chock which is to be removed by a branch 36 extending to the connector 37 which couples one end of the spring 35 with the chock about to be removed. Then, when pull is exerted on the cable or chain 34, the wedge 29 swings laterally on the fulcrums 30 and is withdrawn. As soon as the wedge 29 is withdrawn, the chock being removed is pulled toward said adjacent chocks by the spring 35 and continued pull on the cable or chain 34 removes the chock from beneath the portion of the mine roof which is to fall. It will be noted that the spring 35 is connected to a lower portion of an adjacent chock and to the upper portion of the chock which is to be removed. It may be well to here state also that the wedges 21 are swung laterally on the fulcrums 22 when said wedges 21 are removed. The chock 24 which has thus been removed is then carried over and re-erected in the new row of chocks behind the machine 14. When the previously erected row of chocks is removed the new row of chocks support the roof in a manner to form a line of fracture as illustrated to advantage in Figure 3 of the drawings. It will thus be seen that substantially all of the coal in the pillars or supports 10 of the mine is recovered.

It is believed that the many advantages of the invention will be readily understood, and although the preferred method is herein described, it is to be understood that changes may be resorted to which will fall within the scope of the invention as claimed. For instance, this plan can be applied to any system of development, no mattter what the thickness of pillars are, if strong enough to break the overlying strata, without crushing.

What is claimed is:—

1. An apparatus for use in mining coal comprising a chock for supporting the roof of the mine, a sprag for insertion in a kerf for supporting coal above said kerf in the face of the mine, and a coil spring connecting the sprag to the chock and yieldingly urging the sprag out of the kerf.

2. An apparatus for use in mining coal comprising a chock for supporting the roof of the mine, a sprag for insertion in a kerf for supporting coal above said kerf in the face of the mine, and a coil spring connecting the sprag to the chock and yieldingly urging the sprag out of the kerf, said sprag including a pair of plates hingedly interlocked at one end, blocks fixed on the outer sides of the plates, a wedge insertable between the plates, fulcrums on one end portion of the wedge engageable with the plates for swinging the wedge outwardly from the plates, and an arm projecting from the wedge and providing means for removing said wedge from between the plates.

JOHN C. McDERMOTT.