April 14, 1953 A. L. BARRETT 2,634,963

VEIN DISINTEGRATING MECHANISM HAVING SIDE BOARDS

Filed Dec. 28, 1948 5 Sheets-Sheet 1

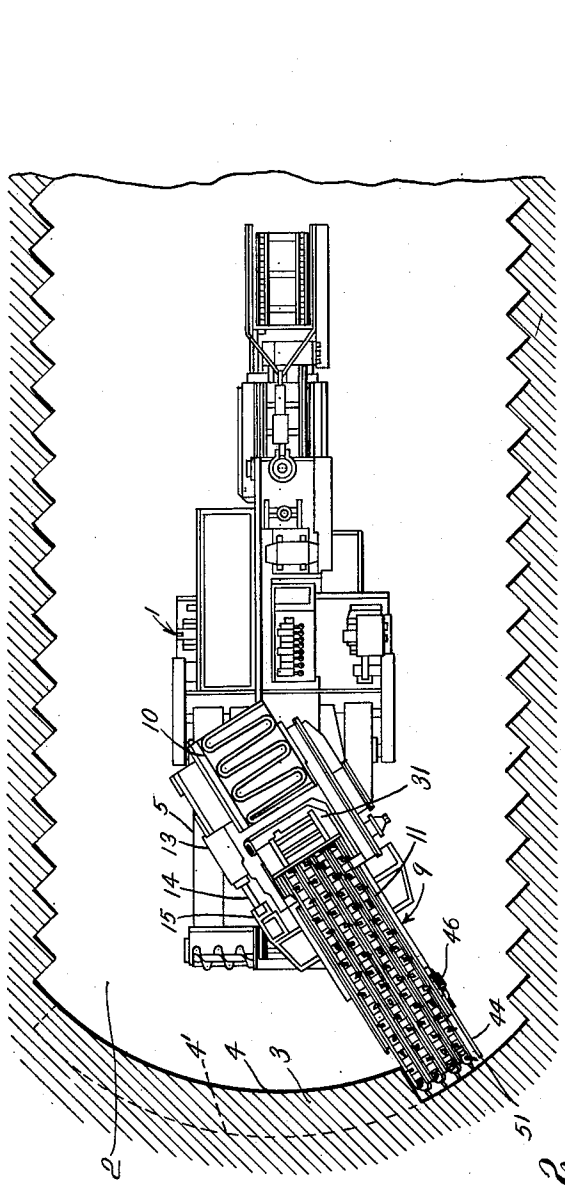


Fig. 1.

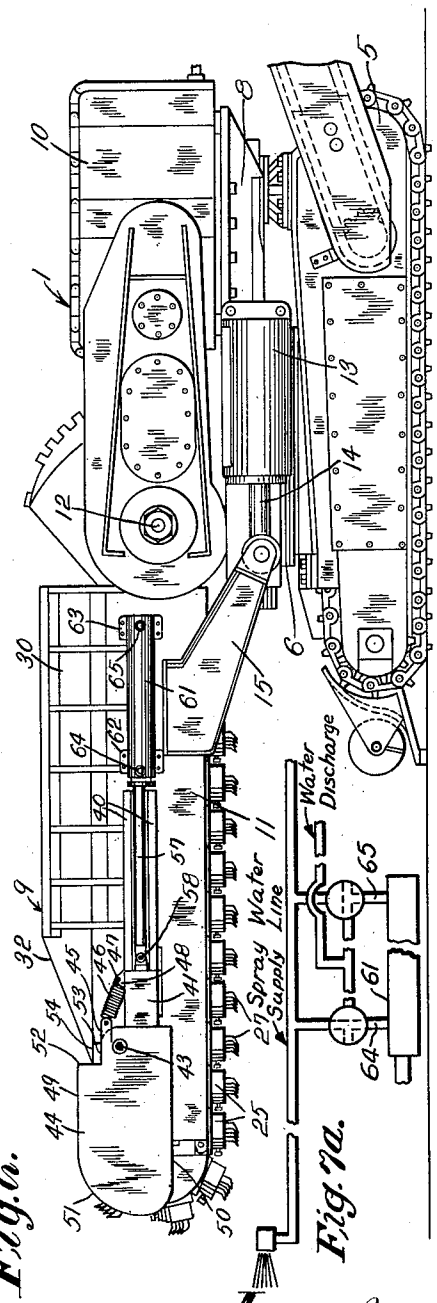


Fig. 2.

Fig. 2a.

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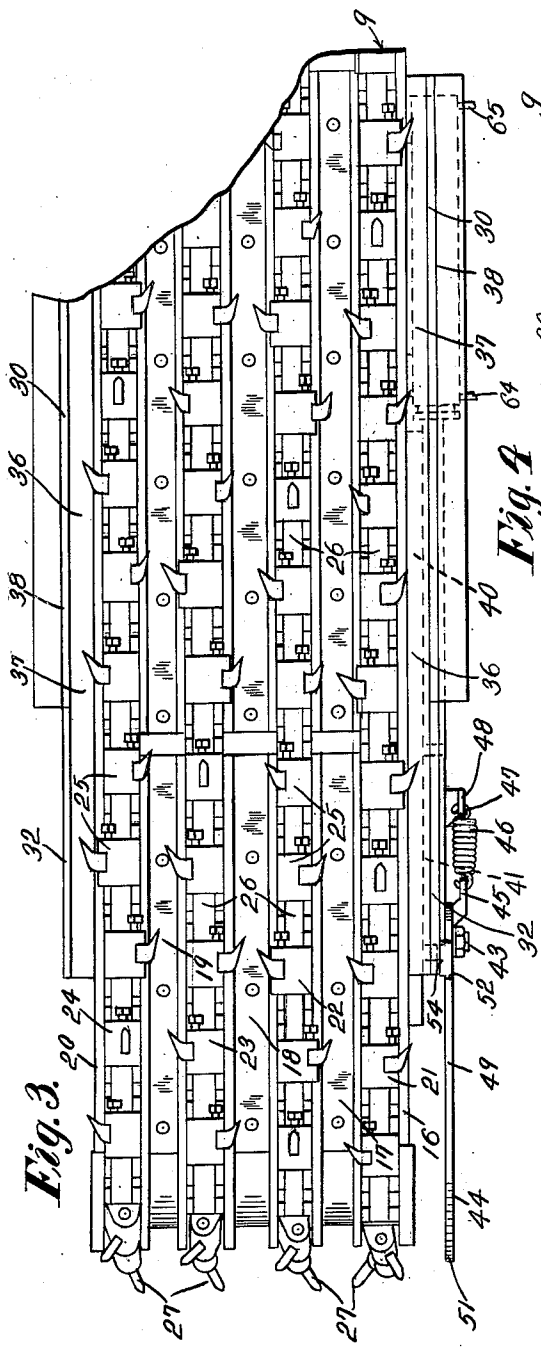


Fig. 3.

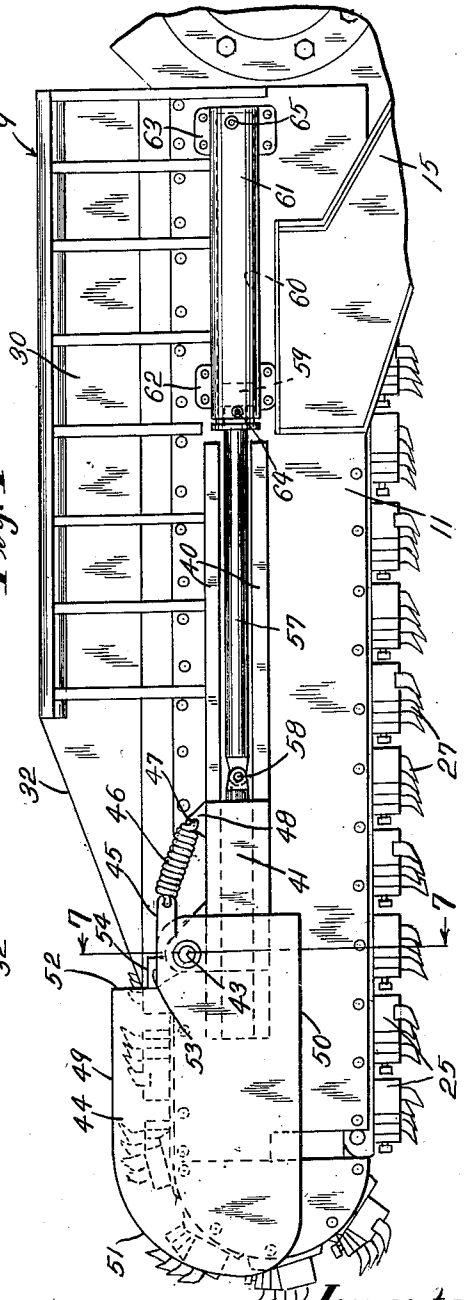


Fig. 4

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VEIN DISINTEGRATING MECHANISM HAVING SIDE BOARDS

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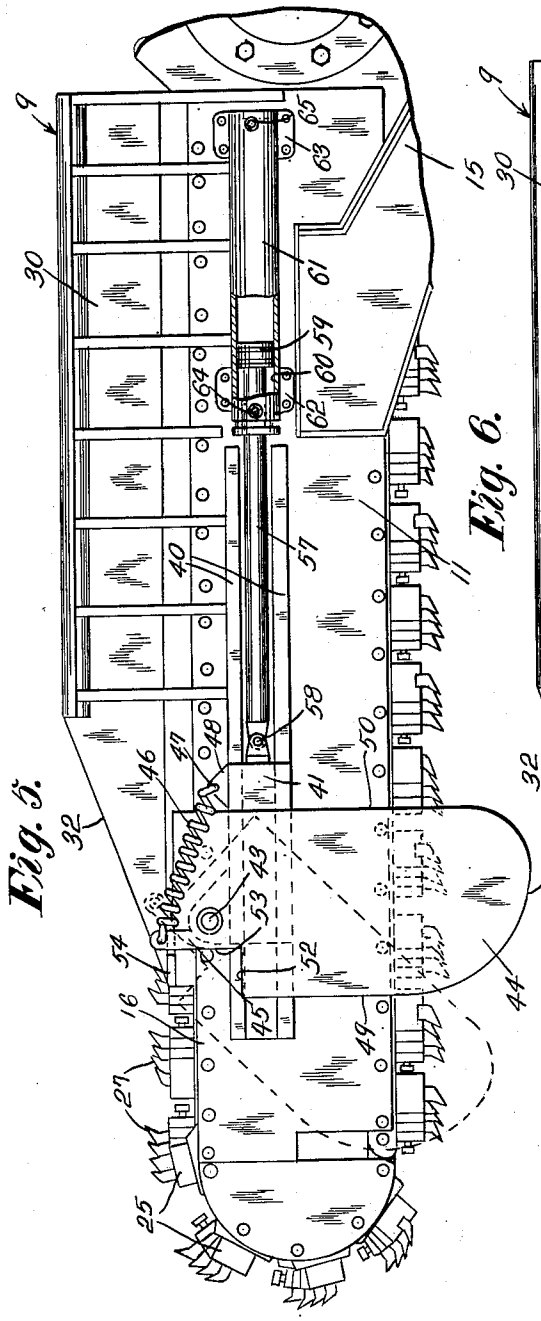


Fig. 5.

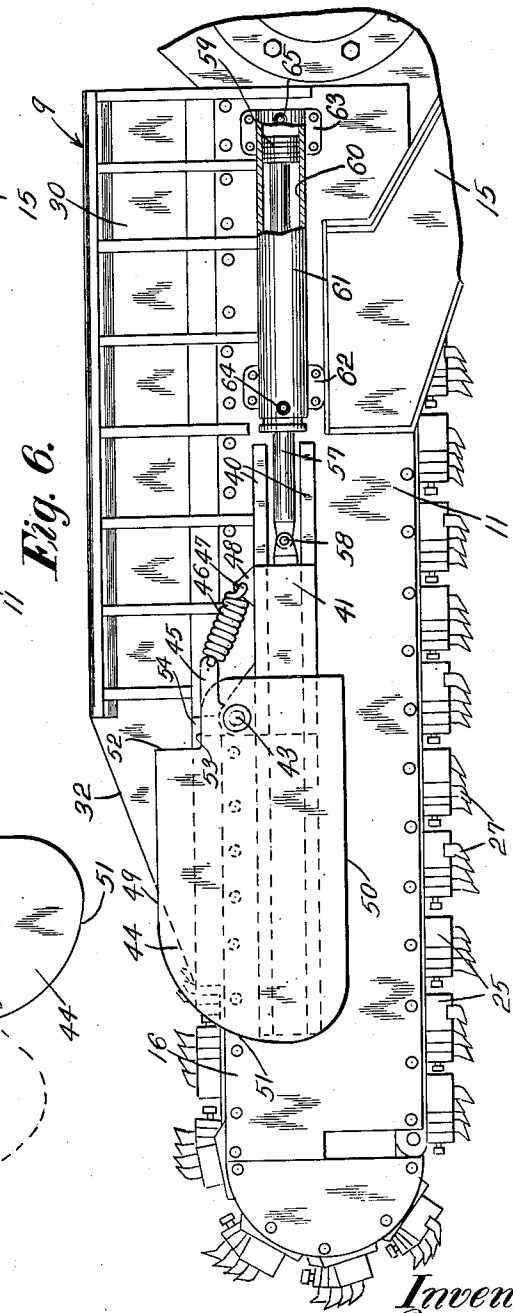


Fig. 6.

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Fig. 7.

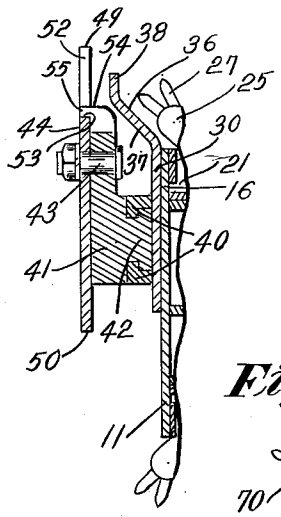


Fig. 8.

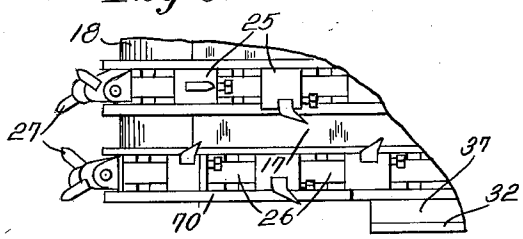


Fig. 9.

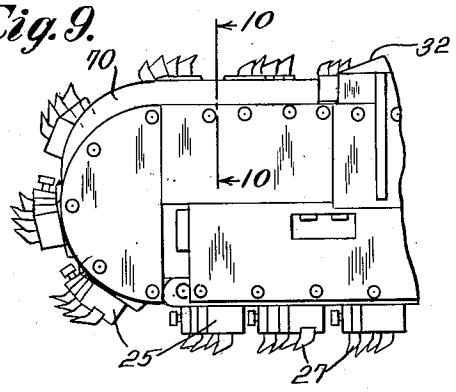


Fig. 10.

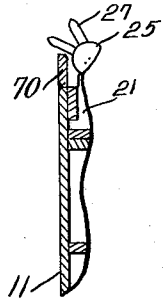


Fig. 12.

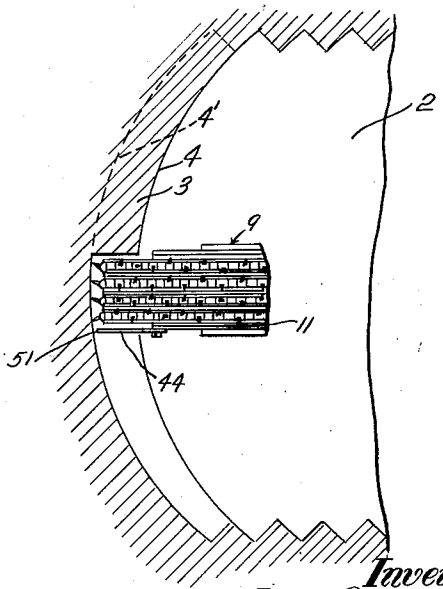
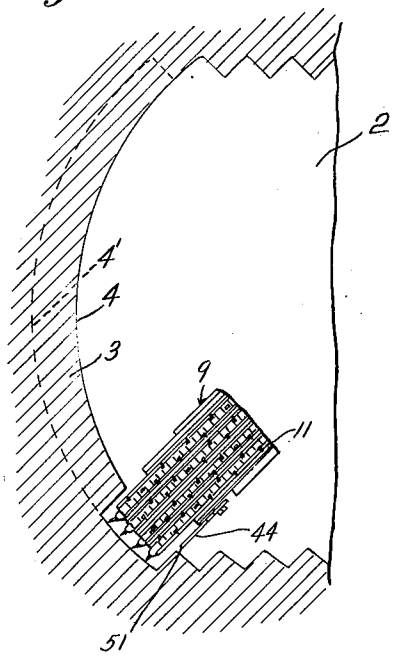


Fig. 11.



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VEIN DISINTEGRATING MECHANISM HAVING SIDE BOARDS

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Fig. 13.

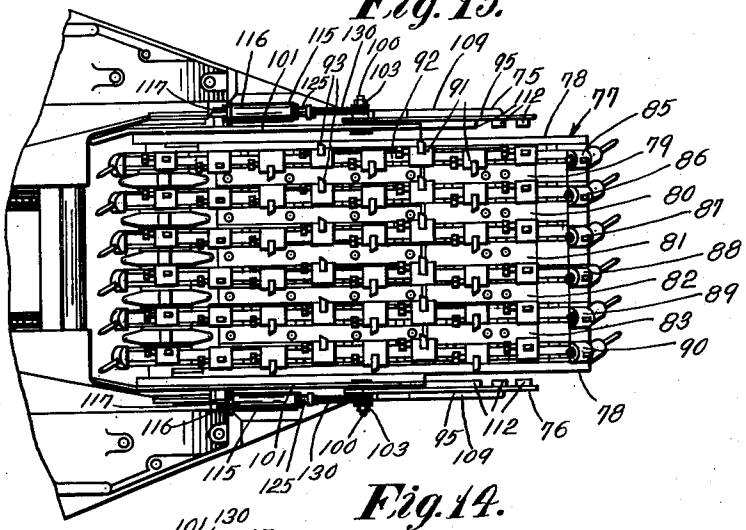


Fig. 14.

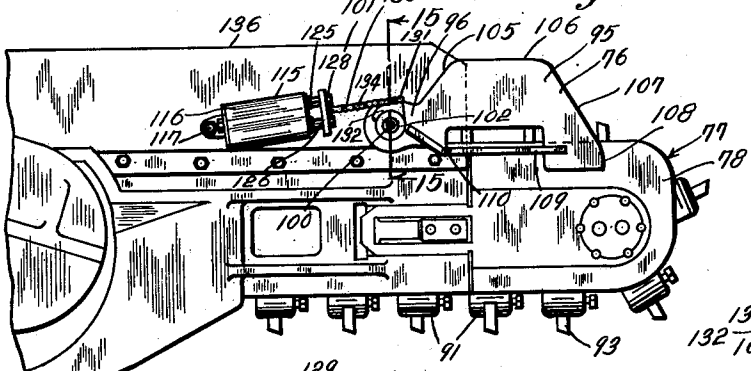


Fig. 15.

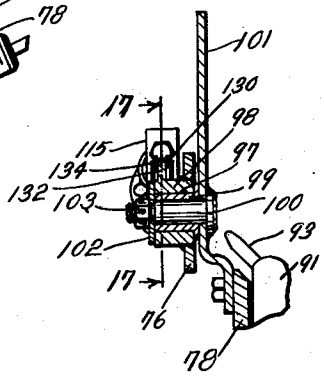


Fig. 16.

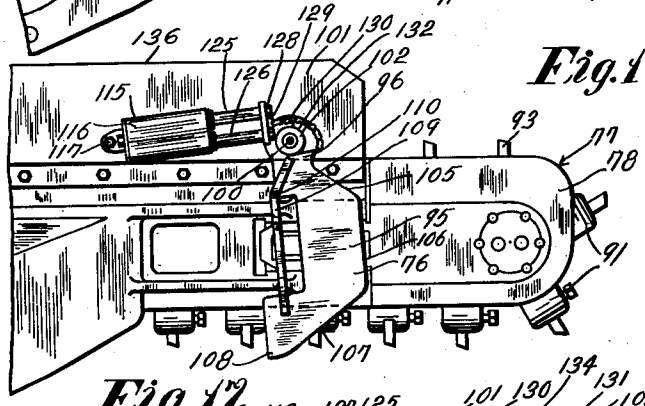
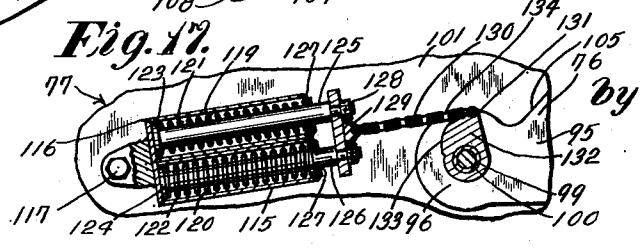


Fig. 17.



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Patented Apr. 14, 1953 2,634,963

UNITED STATES PATENT OFFICE

2,634,963

VEIN DISINTEGRATING MECHANISM HAVING SIDE BOARDS

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Application December 28, 1948, Serial No. 67,627

6 Claims. (Cl. 262—29)

1

This invention relates to material disintegrating apparatus and more particularly to material disintegrating apparatus having improved means associated with it for minimizing the escape of material which it tears loose, and for insuring the delivery of as large an amount of the disintegrated material as possible at the delivery end of the apparatus.

The invention finds particular utility with continuous miners. Continuous miners are machines for the substantially continuous disintegration of mineral veins, such as coal seams, and for the substantially continuous loading out of the disintegrated material, the disintegrating and loading out being carried on as a relatively continuous process interrupted only by brief intervals during which repositioning of the vein-attacking mechanism thereof or of the apparatus as a whole is taking place.

Continuous miners commonly comprise a movable base by which they are supported on and moved over a mine bottom, and mechanisms supported by the base for attacking, disintegrating and loading out the constituent material of a series of vertical bands differently disposed across a working face, until a strip extending from the mine floor to the mine roof and for the full width of the working face has been disintegrated and removed, after which another arcuate section extending across the width of the room or entry will be attacked, disintegrated and loaded out.

As a consequence of their mode of operation, which consists generally, in the case of the disintegration of any given band, of a sumping operation at the bottom, a vertical swinging operation, and usually a withdrawing movement, there will be, except for the band adjacent one rib—the rib at which the first of a series of vertical bands extending across the face is attacked, an open-sided band attacked by the disintegrating mechanism, with the result that as the band is disintegrated a considerable amount of material torn loose from the vein may escape laterally in the event no special intercepting and guiding means for the disintegrated material is provided.

The escape of disintegrated material may be considerably reduced by the provision of a side guard plate, or side board. Such a side plate or side board will be of maximum effectiveness if it can be extended just as far forwardly with respect to the disintegrating mechanism as possible, and if it can be maintained in a position in which the upper edge thereof, assuming upward movement of the disintegrating mechanism to take place during the swinging portion of the

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operating cycle thereof, will be at least as high as the upper run of the disintegrating devices. Moreover, such a device will need to be movable to a position with respect to the disintegrating mechanism wherein it will not interfere with standing mineral, either being made swingable to that end or being made retractable longitudinally of the disintegrating mechanism, and also swingable, preferably, since it cannot be in the advanced position desirable for subsequent attacks on the vein when the first one of a series of attacks on a given transverse band is being made. Also, if the side boards are duplicated at the opposite ends of a disintegrating apparatus, one will at all times need to be in back position. Likewise, such a device should be so constructed that in the event that it strikes a projecting rib or core of coal, or strikes against the mine roof, it may freely swing down, yet nevertheless be held in its raised position, though yieldingly, with adequate force to prevent its being moved to a partially or wholly inoperative position except in the event that a substantial obstruction is met. Such a side board arrangement will also desirably have the controlling means therefor, that is to say its positioning means, power operable and capable of yielding backward in the event of the meeting of a counterthrust exceeding the forces tending to advance it.

One very desirable arrangement will consist of a pressure fluid operated, advancing and retracting means movable on a guided support element toward and from the outer end of the disintegrating apparatus, the guided support element supporting for swinging movement about a transverse axis a side board whose upward swinging is positively limited as by stop means, and which is depressible arcuately downward by swing about such axis against the action of yielding means, as for example, but without limitation thereto, a spring, the side board being retractable so as to lie wholly outside the face when desired, being advanceable into close adjacency to the portion of the face opposite which it is movable on all except the first band attacked on a given transverse face, and being swingable downwardly when an obstruction is struck in such a manner as to prevent substantial danger of breakage. Another desirable arrangement may comprise a suitably shaped side board, pivotally mounted preferably at a rear upper corner and yieldingly held in a substantially horizontal position when the disintegrating mechanism is horizontal and having its forward end so shaped that engagement by it during forward movement will cause

its downward swing, there being provided means for yieldingly holding said board in its raised (extended) position.

It is an object of my invention to provide an improved side board arrangement for minimizing the escape of coal or other disintegrated material from the disintegrating mechanism of a continuous miner or the like. It is another object of the invention to provide an improved side board having mounting means relative to which it is downwardly and rearwardly swingable when an obstruction is met but normally yieldably held in raised position. It is still another object of the invention to provide an improved slidable and swingable side board type of apparatus for use in association with a disintegrating mechanism—one which may be advanced and retracted as well as swung upwardly and downwardly, and which may include arrangements so that one of said movements, preferably the swinging movement, may be effected by resilient means while the other is more positively, or at least more forcibly, effected. It is yet a further object of the invention to provide an improved side board arrangement in which the side board may be positionable close to the forward end of the disintegrating apparatus, and desirably at least as high as the upper run of the disintegrating elements. Still another object of the invention is to provide an improved side board arrangement having an expansible - chamber - motor - controlled positioning mechanism for advancing and retracting the side board rectilinearly, and resilient means for maintaining the side board normally in its desired working position. Other objects and advantages of the invention will hereinafter more fully appear.

In the accompanying drawings in which two illustrative embodiments of the primary invention and a subsidiary invention are shown,

Fig. 1 is a plan view of a continuous miner engaged in the disintegration of the second of a series of vertical bands, which series extends across a face.

Fig. 2 is a side elevational view of the forward portion of the continuous miner shown in Fig. 1.

Fig. 3 is an enlarged top view, with parts broken away, of the disintegrating mechanism shown in Figs. 1 and 2.

Fig. 4 is a side elevational view of the disintegrating mechanism, on a larger scale than Fig. 2, and with parts broken away, the improved side board arrangement being shown in its forward and raised position.

Fig. 5 is a similar view showing the side board nearly as far forward, but in a depressed position.

Fig. 6 is a similar view, showing the side board in its retracted, raised position.

Fig. 7 is a vertical transverse section on a further enlarged scale, the section being taken on the vertical plane of the section line 7—7 of Fig. 4.

Fig. 7*a* is a diagrammatic view showing fluid supply arrangements.

Fig. 8 is a fragmentary view of the forward end of a disintegrating mechanism, showing a modified construction.

Fig. 9 is a side elevational view of the structure shown in Fig. 8, also showing the modified construction.

Fig. 10 is a fragmentary vertical section on the plane of the section line 10—10 of Fig. 9.

Fig. 11 is a fragmentary diagrammatic view showing a disintegrating mechanism, constructed according to the embodiment of the invention shown in Figs. 1 to 7, making an initial or rib attack on a face.

Fig. 12 is another fragmentary diagrammatic view showing a disintegrating mechanism according to the same embodiment of the invention working on a face near the center of the latter.

Fig. 13 is a plan view of another disintegrating mechanism, showing a different side board arrangement.

Fig. 14 is a side elevational view of the disintegrating mechanism and one of the side boards of Fig. 14.

Fig. 15 is an enlarged cross sectional view on the plane of the line 15—15 of Fig. 14.

Fig. 16 is a view similar to Fig. 14, showing the side board in depressed position.

Fig. 17 is a fragmentary longitudinal section on the plane of the section line 17—17 of Fig. 15.

Referring to the drawings, and first to Figs. 1 and 2 thereof, a continuous miner generally designated 1 is shown working in an entry 2 in a coal mine. It operates by successively removing arcuate vertical strips of coal 3, each of which extends for the full width of the entry, the forward surfaces of these strips successively forming new faces, the face on which work is being done in Fig. 1 being numbered 4 and the next face to be attacked being numbered 4'. The removal of the successive strips is accomplished by the successive removal of a plurality of vertical bands which jointly make up the successive strips, each vertical band extending from the mine floor to the mine roof and being of appropriate depth normal to the face and of a width determined by the design of the machine.

The disintegrating apparatus includes a portable base 5 which may be of any suitable construction, being shown as tractor mounted. On this base there is arranged a turntable mechanism 6 upon which there is slidably guided for reciprocation a slidable frame 8, of which the opposite movements are adapted to effect sumping and withdrawing movements of a disintegrating mechanism 9 driven by a motor 10. The disintegrating mechanism includes a vertically swingable frame 11 pivoted for vertical swinging movement upon an axis 12 and adapted to be swung vertically by a hydraulic cylinder and piston means 13 connected by a connecting rod 14 to a depending arm 15 carried by the disintegrating mechanism. The disintegrating mechanism provides appropriate guides for a series of circulating chains, a portion of these guides being shown in Fig. 3, in which they are designated 16, 17, 18, 19 and 20. Guides at the opposite sides of the paths of each of the circulating chains mentioned cooperate in guiding the latter. A series of four circulating chains, respectively designated 21, 22, 23, and 24, is shown in the drawings, but it will be appreciated that the invention is not limited to any particular number of chains.

The circulating chains include disintegrating element carrying blocks 25 connected by intermediate links 26. Disintegrating elements 27 are carried by the blocks 25, and these are illustrated as in the general form of conventional cutter bits, but they may obviously assume various forms and may also be arranged in various patterns by the appropriate arrangement of the several chains with respect to each other. The particular pattern of the disintegrating elements shown in several of the figures is that which is illustrated in the application of Harold F. Silver, Ser. No.

11,688, filed February 27, 1948, which application is owned by my assignee.

The disintegrating apparatus has as a part of it, upper side walls 30 forming a trough which guides the disintegrated material and prevents the lateral escape thereof as the upper runs of the chains 21, 22, 23, and 24 carry the material back toward an opening 31 communicating with a hopper or receiving space from which the material is moved by suitable conveying means to a rearward point of discharge. These fixed side walls are tapered at their forward ends, as shown at 32, so as not to strike the roof in the raised position of the disintegrating mechanism. Necessarily, since they are not adjustable relative to the disintegrating mechanism, they must terminate at a point at least slightly more remote from the innermost (forward) end of the disintegrating mechanism than the maximum depth of penetration of the disintegrating mechanism. Thus there will be a substantial distance forwardly of the side walls 30 along which lateral escape of material is possible if no other provision is made. This distance at the side of the disintegrating mechanism which is not closed to the escape of disintegrated material may in certain machines now in use be on the order of close to two feet in length and several inches in height. During the upswing, disintegration of material will be taking place from a position about opposite the vertical center of the forwardmost point of the disintegrating mechanism upwardly and outwardly to the point where the disintegrating elements emerge from the face.

To prevent as completely as possible this escape of material, I have provided, in the first illustrative embodiment of my invention, a slidable and swingable side board arrangement which I will now describe. First however, it may be well to note that the upper side walls 30 of the frame which guides the chains carrying the disintegrating elements are relatively upright, and that at their tops they include trough-forming elements 36 consisting of outwardly sloping portions 37 and upper vertical portions 38, the latter being spaced apart from each other more widely than the side walls 30.

Longitudinally extending guides 40 are, as shown, secured to one of the side plates of the disintegrating mechanism, and guide a slide 41 which has a T-head 42 received within and slidable between the guides 40. This element 41 has pivotally secured to it, near its forward end, by means of a pivot element 43, a side board or side plate 44. The latter has a rearwardly extending arm 45 to which a spring 46 is connected at one end, the other end of the spring being connected at 47 to an ear 48 formed at the rearward end of the guide element 41. The side board 44 is elongated, and has its upper and lower edges 49 and 50 relatively parallel to each other, the upper edge having its forward end tapering on a long arc 51 downwardly in such manner that while the side plate will not strike the inner end of the recesses left by the successive removal of bands of material, yet it will leave very little room for the escape of material. The rearward end 52 of the upper side of the side board is cut away to provide a surface 53 adapted to engage a stop element 54 positioned as shown in Figs. 5 and 7 at 55 and carried by the slide 41. A piston rod 57 is pivotally connected at 58 to a connecting device carried by the rearward end of the slide 41. This piston rod has a piston 59 at its rearward end which is reciprocable in the bore 60 of

a cylinder 61 mounted by pads 62 and 63 fixed to the side of the disintegrating mechanism. Hydraulic fluid may be admitted through conduits 64 and 65 to the opposite ends of the cylinder 61 to effect retraction and advance of the side board construction which has been described. A desirable source of hydraulic fluid for the purpose is the spray water which is usually supplied at a pressure on the order of 65 p. s. i. to keep down dust. At this pressure, forces sufficient to force back the parts, and, yet without breakage, may expel fluid from the rear end of the cylinder.

The mode of operation of the structure which has been described will be readily understood, and reference may be made to Figs. 6, 4 and 5 for the purpose of facilitating the understanding of the mode of operation. Fig. 6 shows the side board 44 in its retracted position. The spring 46 holds it in its upswung position, with the surface 53 on the side board against the stop 54 on the slide 41. The forward end of the side board is back just far enough with respect to the disintegrating mechanism so that when the latter is sumped in to the coal or the mineral vein for its full intended distance, on any cycle except the first, the forward end of the side board will not engage the face. Supply of fluid to the conduit 65 may be effected in any suitable manner from any suitable source as from the water supply commonly provided for spraying on the portion of the face being attacked. This supply through the conduit 65 will not be effected by the operator until after the first band has been disintegrated, the band shown in process of disintegration in Fig. 11. When the disintegrating mechanism has, however, been brought to the position for attack on the second vertical band, as shown in Fig. 1, then the side board will be moved to the position shown in Fig. 4, and it will assume this position unless there is encountered some obstruction such as a projecting fin or core of coal extending outwardly from the face. If, as the side board is moved ahead, it meets an obstruction, it may be depressed as shown in the broken line position of Fig. 5 or even to the full line position of Fig. 5. If the obstruction has been caused by a projecting fin or core of coal and this either does not extend to the top or is broken off in the course of the disintegrating of the adjacent band, the spring 46 will automatically bring the side board 44 up to the position shown in full lines in Fig. 4 and the board will be advanced to the full line position of Fig. 4. The two positions of Fig. 5 are intended to indicate relationships of the parts in which the side board has not been forced completely forward.

It will be evident that I have provided a construction in which without any interference with the making of the initial attack adjacent one rib of a room or entry there may be provided nevertheless a highly effective diminution of the free escape of material toward the open side of the disintegrating mechanism. In its lowered position (full line position) of Fig. 5, and in its substantially fully retracted position of Fig. 6, the side board will be wholly outwards of any position in which interference with disintegrating can occur.

In Figs. 8, 9 and 10 there is shown a modified construction in which there is no adjustable side board. Here a narrow vertical plate section 70 is welded along the upper edge of the disintegrating mechanism frame at the forward end of the latter. This is extended up above the top of the

frame so as to be just below the line of travel of the disintegrating-element-supporting blocks. At the forward end this plate tapers away to nothing at about the center of the forward end of the disintegrating mechanism. This arrangement does not have all of the advantages of the embodiment of the construction first shown, but does provide for some reduction in the free escape of material. Fig. 12 is included to show the projected side board in use in the course of disintegration of the central upright band.

Referring next to Figs. 13 to 17, it will be noted that I have illustrated a modified side board arrangement in which there are two side boards 75 and 76, one at each side of a disintegrating mechanism 77. This disintegrating mechanism is somewhat more compact longitudinally than the disintegrating mechanism of Figs. 1, 2, 3, 4, 5, 6, 11 and 12, and it is wider, or at least has a greater number of chains carrying disintegrating elements, and the disintegrating elements are of a different shape. The frame and support of the disintegrating mechanism includes a side plate 78, intermediate guides 79, 80, 81, 82 and 83, and another side plate 78. These cooperate in the guiding of disintegrating element carrying chains 85, 86, 87, 88, 89 and 90, these chains including disintegrating element carrying blocks 91 and intermediate links 92, and the blocks 91 carrying disintegrating elements 93. This disintegrating mechanism is sumped in at the bottom, swung up and, generally at least, withdrawn, in substantially the same manner as the disintegrating mechanism first illustrated and described.

The side boards 75 and 76 in this illustrative embodiment of the invention are not rectilinearly reciprocable bodily longitudinally of the disintegrating apparatus but are instead confined to swinging movement in generally vertical planes with respect to the disintegrating medhanism. They do not extend as far forwardly as does the side board of the first embodiment of the invention, when such side board is in its upswung and most forwardly advanced position. The side boards 75 and 76 are so shaped and pivoted that the encountering of serious resistance to their continued upward movement during upswing of the disintegrating mechanism will cause them to be swung down to the position shown in Fig. 16, and thus avoid breakage. Their forward ends are so shaped, moreover, as in conjunction with the location of the pivot about which swinging movement takes place upon the meeting by the side boards of an obstruction while the disintegrating mechanism is being sumped into the mineral seam, to cause the side boards to be swung down and back to the requisite degree.

Referring now to Figs. 14, 15, 16 and 17, it will be seen that each of the side boards consists of a main body portion 95 and a smaller terminal portion 96 by means of which the side board is supported for swinging in vertical planes. A bearing bore 97 in a sleeve portion 98 welded to the side board turns on a bushing 99 supported by a pin or bolt 100 from a trough-forming portion 101 carried by the disintegrating mechanism. A washer 102 and nut 103 prevent the lateral escape of the side board off of the bushing 99 and pin 100. When in the position of Fig. 14, the side board will be observed to be shaped in such a manner that it slopes upward from the portion 96, as at 105. It has a relatively flat elevated top 106, and its forward end is formed on a long forward taper 107 and terminates in a nose 108. The side board is provided with a flange 109 bent as at 110 between its ends and welded to the side of the side board 95, the flange provided for reinforcement of the side board. There are also provided on the side board at its inner side various lug or web portions 112 to reduce the amount of open space between the side board and the adjacent side plates 78. The side board is normally held in its generally horizontal position shown in Fig. 14 by yielding means which permit down swing of the side board when an obstruction is encountered either at the nose 108, or by the upper surface 106, or at other points which might engage obstructions during upswing or sumping movement of the disintegrating mechanism. So as yieldingly to support the side board and permit its downward swing when necessary and to restore it to raised position when this is desired, resilient means in the form of an enclosed double spring structure 115 is provided. This includes a housing 116 for a plurality of springs, pivotally supported as at 117 on a side frame 78 and having bores 119 and 120 in which springs 121 and 122 are housed, these springs engaging the heads 123 and 124 respectively of rods 125 and 126 which extend through openings 127 in the front heads of the spring housings and are connected at 128 to a plate having an ear 129 to which a roller chain 130 is connected. This roller chain is at its other end connected to the upper corner 131 of a cam 132 which is herein shown as formed integral with the sleeve portion 98. The contour of the cam provided at 133 not only allows the chain 130 to be smoothly laid or wrapped upon the contoured surface of the cam as the side board is forced downwardly toward the position shown in Fig. 16, but also in view of the diminishing radius of the cam surface, there is provided gradually increased leverage as the springs are compressed, thus allowing the side board to be substantially equally yieldable to obstructions which it may meet, regardless of its angular position. It may be noted that the width of the cam is such that the side links 134 of the chain at their inner edges lie at opposite sides of the surface of the cam.

It will be clear that in the free position of the side board, it will occupy the relation to the disintegrating mechanism shown in Fig. 14. Its upper edge 106 will be nearly up to the level of the upper edge 136 of the trough-forming portion 101. Springs 121 and 122 will hold the cam 132 in the position shown in Figs. 14 and 17, and the side board will be held raised. If during upswing of the disintegrating mechanism or sumping movement of the latter the side board strikes an obstruction, it will be swung down either toward or fully to the position shown in Fig. 16. This will result in the wrapping of the chain 130 around the contour 133 of the cam, the pulling outward of the plate 128 and of the rods 126, and the compression of the springs 121 and 122. When the side board is in position shown in Fig. 16, it will be evident that it lies wholly outside of the work. Due to the presence of two side boards, the apparatus may start to work at either entry of a rib or room. Both of the side boards will have to be depressed during the performing of the first disintegrating operation on a vertical band. On all subsequent vertical band attacks until the opposite side of the room or entry is reached, the side board toward the rib toward which the initial attack was made will, except when an obstruction is met, be maintained in its raised position, while at the other side the side board will be forced down to the position of Fig. 16 because it will engage the solid coal. This

structure is simple, rugged and for most conditions will provide as satisfactory operation as the first modification disclosed. Its operation needs no more description in view of what precedes.

From what has been said it will be evident that each of the major embodiments of the invention includes a vertically swinging side board, that one or a pair of boards may be provided, that in these embodiments the boards may be moved out of the way, if obstructions are encountered, without any danger of breakage, that these embodiments are simple, rugged and desirable, and that the modification is adapted to improve material handling and could be used with one or the other of the embodiments.

While there are in this application specifically described two forms and a detail modification which the invention may assume in practice, it will be understood that these forms of the same are shown for purposes of illustration and that the invention may be further modified and embodied in various other forms without departing from its spirit or the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. In a vein-disintegrating and material-conveying mechanism, a bar structure having extending along its opposite sides upwardly projecting walls cooperating with said bar structure to form an open-topped trough extending along the upper side of said bar structure, said upwardly projecting walls terminating short of the forward end of said bar structure, disintegrating elements carried by said bar structure and supported for movements in orbits in parallel upright planes extending between said upwardly projecting walls, said orbits having forward portions at the forward end of said bar structure in advance of the forward ends of said walls, and a side board mounted on said bar structure and movable relative to the latter translationally and pivotally in upright planes parallel to said first mentioned upright planes, and in one position relative to said bar structure occupied during vein-disintegration forming a forward extension of the upwardly projecting wall at its own side of said bar structure and alongside but laterally outward of the most adjacent disintegrating element orbit, at a portion of such orbit which lies inside a working face during a vein-attacking operation, said side board having for the supporting and positioning thereof as aforesaid means including a guide extending lengthwise of said bar structure, a slide reciprocably supported by said guide, a pivotal connection, on an axis perpendicular to said planes, between said board and slide, and cylinder and piston mechanism for advancing and retracting said board and slide in upright planes.

2. In a vein-disintegrating and material-conveying mechanism, a bar structure having extending along its opposite sides upwardly projecting walls cooperating with said bar structure to form an open-topped trough extending along the upper side of said bar structure, said upwardly projecting walls terminating short of the forward end of said bar structure, disintegrating elements carried by said bar structure and supported for movements in orbits in parallel upright planes extending between said upwardly projecting walls, said orbits having forward portions at the forward end of said bar structure in advance of the forward ends of said walls, and a side board mounted on said bar structure and movable relative to the latter translationally and pivotally in upright planes parallel to said first mentioned upright planes, and in one position relative to said bar structure occupied during vein-disintegration forming a forward extension of the upwardly projecting wall at its own side of said bar structure and alongside but laterally outward of the most adjacent disintegrating element orbit, at a portion of such orbit which lies inside a working face during a vein-attacking operation, said side board having for the supporting and positioning thereof as aforesaid means including a guide extending lengthwise of said bar structure, a slide reciprocably supported by said guide, a pivotal connection, on an axis perpendicular to said planes, between said board and slide, and means for advancing and retracting said board and slide in upright planes and normally maintaining said board in said one position when said board and slide are in their advanced position including cylinder and piston mechanism carried by said bar structure at one side of the latter.

3. In a vein-disintegrating and material-conveying mechanism, a bar structure having extending along its opposite sides upwardly projecting walls cooperating with said bar structure to form an open-topped trough extending along the upper side of said bar structure, said upwardly projecting walls terminating short of the forward end of said bar structure, disintegrating elements carried by said bar structure and supported for movements in orbits in parallel upright planes extending between said upwardly projecting walls, said orbits having forward portions at the forward end of said bar structure in advance of the forward ends of said walls, and a side board mounted on said bar structure and movable relative to the latter translationally and pivotally in upright planes parallel to said first mentioned upright planes, and in one position relative to said bar structure occupied during vein-disintegration forming a forward extension of the upwardly projecting wall at its own side of said bar structure and alongside but laterally outward of the most adjacent disintegrating element orbit, at a portion of such orbit which lies inside a working face during a vein-attacking operation, said side board having for the supporting and positioning thereof as aforesaid means including a guide extending lengthwise of said bar structure, a slide reciprocably supported by said guide, a pivotal connection, on an axis perpendicular to said planes, between said board and slide, and means for advancing and retracting said board and slide in upright planes and normally maintaining said board in said one position when said board and slide are in their advanced positions including cylinder and piston mechanism carried by said bar structure at one side of the latter and a yielding connection between said board and slide exerting a turning moment on said board tending to maintain it in alinement with the adjacent side of said bar structure.

4. In a vein-disintegrating and material-conveying mechanism, a bar structure having extending along its opposite sides upwardly projecting walls cooperating with said bar structure to form an open-topped trough extending along the upper side of said bar structure, said upwardly projecting walls terminating short of the forward end of said bar structure, disintegrating elements carried by said bar structure and supported for movements in orbits in parallel upright planes extending between said upwardly

projecting walls, said orbits having forward portions at the forward end of said bar structure in advance of the forward ends of said walls, and a side board mounted on said bar structure and movable relative to the latter pivotally in upright planes parallel to said first mentioned upright planes, and in one position relative to said bar structure occupied during vein-disintegration forming a forward extension of the upwardly projecting wall at its own side of said bar structure and alongside but laterally outward of the most adjacent disintegrating element orbit, at a portion of such orbit which lies inside a working face during a vein-attacking operation, said side board having for the supporting and positioning thereof as aforesaid means including a pivotal mounting of which the pivot axis is perpendicular to said upright planes and means for exerting a yielding turning moment on said board tending to maintain it in alinement with the adjacent side of said bar structure.

5. In a vein-disintegrating and material-conveying mechanism, a bar structure having extending along its opposite sides upwardly projecting walls cooperating with said bar structure to form an open-topped trough extending along the upper side of said bar structure, said upwardly projecting walls terminating short of the forward end of said bar structure, disintegrating elements carried by said bar structure and supported for movements in orbits in parallel upright planes extending between said upwardly projecting walls, said orbits having forward portions at the forward end of said bar structure in advance of the forward ends of said walls, and a side board mounted on said bar structure and movable relative to the latter pivotally in upright planes parallel to said first mentioned upright planes, and in one position relative to said bar structure occupied during vein-disintegration forming a forward extension of the upwardly projecting wall at its own side of said bar structure and alongside but laterally outward of the most adjacent disintegrating element orbit, at a portion of such orbit which lies inside a working face during a vein-attacking operation, said side board having for the supporting and positioning thereof as aforesaid means including a pivotal mounting of which the pivot axis is perpendicular to said upright planes and means for exerting a yielding turning moment on said board tending to maintain it in alinement with the adjacent side of said bar structure, said pivotal mounting being adjacent the rearward end of said side board and said board in its aforesaid position having, when said bar structure is horizontal, a forward portion below a horizontal plane which includes said pivot axis.

6. In a vein-disintegrating and material-conveying mechanism, a bar structure having extending along its opposite sides upwardly projecting walls cooperating with said bar structure to form an open-topped trough extending along the upper side of said bar structure, said upwardly projecting walls terminating short of the forward end of said bar structure, disintegrating elements carried by said bar structure and supported for movements in orbits in parallel upright planes extending between said upwardly projecting walls, said orbits having forward projections at the forward end of said bar structure in advance of the forward ends of said walls, and a side board mounted on said bar structure and movable relative to the latter pivotally in upright planes parallel to said first mentioned upright planes, and in one position relative to said bar structure occupied during vein-disintegration forming a forward extension of the upwardly projecting wall at its own side of said bar structure and alongside but laterally outward of the most adjacent disintegrating element orbit, at a portion of such orbit which lies inside a working face during a vein-attacking operation, said side board having for the supporting and positioning thereof as aforesaid means including a pivotal mounting of which the pivot axis is perpendicular to said upright planes and means for exerting a yielding turning moment on said board tending to maintain it in alinement with the adjacent side of said bar structure, said pivotal mounting being adjacent the rearward end of said side board and said board in its aforesaid position having when said bar structure is horizontal. a forward portion below a horizontal plane which includes said pivot axis, the distance of said pivot axis from the forward end of said board when the latter is in said position exceeding the distance of said pivot axis from the overlying portion of the then top edge of said board by such a distance that when said board is swung down to its lowermost position about said pivot axis it lies to the rear of the portions of said orbits in which the disintegrating elements attack a mineral vein.

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