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K. R. BIXBY

2,288,883

SCREEN

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Fig. 1

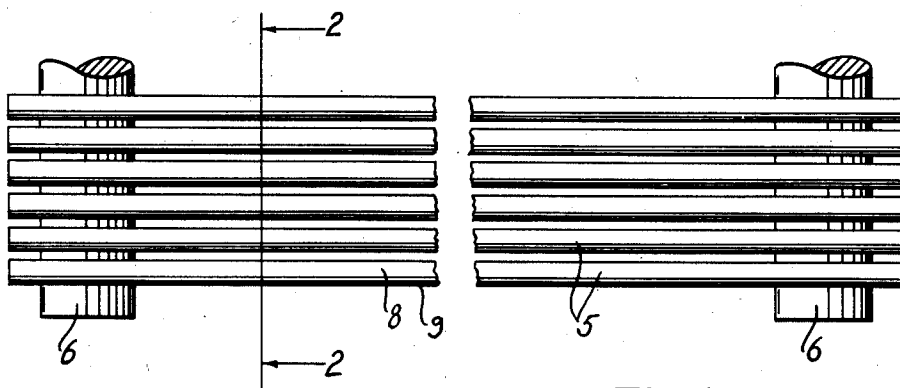


Fig. 4

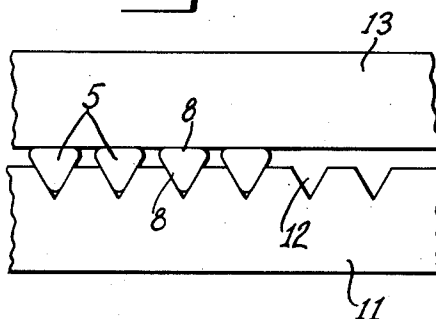


Fig. 2

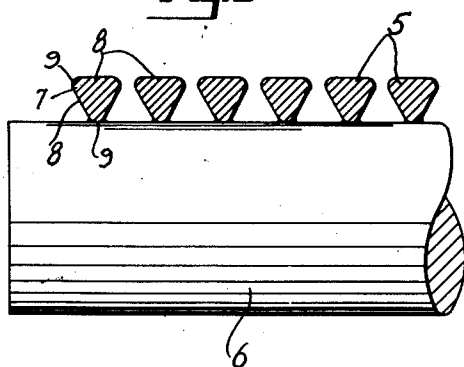
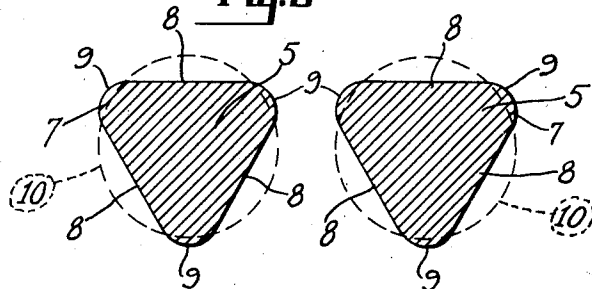


Fig. 3



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SCREEN

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2 Claims. (Cl. 209—393)

This invention relates to a screen and more particularly to a screen of the type used for de-watering washed coal and for like purposes. A screen of this type may comprise one or a plurality of screen sections mounted on a vibratory frame. The individual sections may be of any suitable size, a common size being eight feet in length and approximately three feet in width. Each section usually comprises a plurality of metal rods of narrow width and of relatively great length supported by cross bars rigidly secured to the lower sides thereof. The rods extend for the full length of the screen section, in the direction in which the material moves over the same, and are spaced laterally one from the other very short distances, just sufficient to permit the passage of liquid, dust and very small fragments of the material being screened. The rods are usually of such cross sectional shape that the space between adjacent rods will increase in width from its narrowest point downwardly to permit free discharge of fragments passing between the rods. The rods are of course subjected to severe wear by the coal or other material moving over the same and when the ordinary wedge type of rod is used the wearing away of the upper portions of the rods continuously increases the width of the spaces between the rods and soon renders the screen unfit for use.

To increase the life of the screen I have heretofore used rods which are round in cross section so that the space between adjacent rods increases in width both downwardly and upwardly from its narrowest point, thus permitting the upper halves of the rods to be worn away without increasing the effective width of the spaces between the rods. In some screens these rods are one-sixteenth of an inch or less in diameter and are spaced apart from one sixty-fourth of an inch to one thirty-second of an inch. Due to this relatively narrow spacing small fragments of coal or other material are apt to lodge in the spaces and if they are not promptly dislodged will cause an accumulation of fine material in the spaces which will eventually clog the latter. While the round rods greatly increased the life of the screen they also provided upwardly flared channels above the narrowest parts of the spaces in which small fragments might lodge and which were of such a depth that the corners or projecting edges of the larger pieces of material could not enter the channels so formed far enough to effectively dislodge all fragments lodged in the channels, thus increasing the tendency of the spaces to clog.

One object of the present invention is to provide a screen in which the rods will be of such a character that the screen will have a long life but will have very little tendency to clog.

A further object of the invention is to provide a screen rod of such cross sectional shape that a relatively large part of the rod may be worn away without increasing the width of the spaces between adjacent rods, and that the channels formed above the narrowest parts of the spaces will be of such shallow depth that the larger pieces of material may engage fragments lodged in said channels and dislodge the same.

A further object of the invention is to provide such a rod which may be quickly and easily assembled in the screen section.

Other objects of the invention may appear as the device is described in detail.

In the accompanying drawing Fig. 1 is a plan view, partly broken away, of a portion of a screen section embodying my invention; Fig. 2 is a transverse sectional view, on an enlarged scale, taken on the line 2—2 of Fig. 1; Fig. 3 is a transverse sectional view, on a still larger scale, of two of the screen rods on an enlarged scale; and Fig. 4 is a sectional view of a portion of a device for positioning the rods during the welding operation.

In the drawing which is on a scale larger than that usually employed, I have illustrated a preferred form of screen rod but it should be understood that this form is shown for the purposes of illustration only and that the rod may take various shapes without departing from the spirit of the invention.

The screen, or screen section, as shown in Figs. 1 and 2, comprises a plurality of small rods 5 which extend lengthwise of the screen sections, in the direction in which the material moves over the screen, and which are spaced laterally one from the other distances substantially less than the width of the rods. These rods may be supported in proper relation one to the other in any suitable manner but preferably the lower sides of the rods are rigidly secured, as by welding, to cross bars 6 which are adapted to be mounted in a supporting frame, not here shown. As above stated, the rods are of narrow width and are spaced very short distances one from the other. It is desirable to locate the narrowest width of the spaces between adjacent rods a substantial distance below the tops of the rods so as to permit a relatively large part of the rod to wear away without increasing the effective width of the space, and at the same time to provide the spaces

with upper portions of such a depth that fragments lodging therein can be dislodged by the larger pieces of material passing over the screen. For this purpose each screen rod is of such cross sectional shape that its greatest width is in a line located between and spaced from both the top of the rod and a horizontal plane passing through the longitudinal center of the rod, as shown at 7. The lateral surfaces of the rod above the points of greatest width are preferably curved or otherwise shaped so that the upper portions of the lateral surfaces of each rod converge upwardly. The lateral surfaces of the rod below its line of greatest width converge downwardly so as to provide a downwardly flared space between the lower portions of the rods. By flattening the top surface of the rod the depth of the upper portion of the space between adjacent rods may be further reduced, and by curving the lateral surfaces between the top surface and the points of greatest width of the rod about relatively short axes the transverse width of this upper portion of the space may be further reduced.

These characteristics may be secured in rods of various shapes but I prefer to use the shape shown more particularly in Fig. 3, in full lines, the dotted lines 10 appearing on that figure representing round rods, each of a diameter equal to the greatest width of the rods shown in full lines, thus enabling a ready comparison of the spaces formed between the two types of rod. The cross sectional shape of the rod here shown is approximately that of an equilateral triangle but has its corner portions cut away. The three sides 8 of the rod are of uniform width and are spaced apart equal distances. The adjacent edges of these surfaces are connected by curved surfaces 9 which are described about axes located in lines extending through the longitudinal center of the rod and which would intersect the apices of the triangle if these had not been cut away, and spaced a substantial distance from the center of the rod. This rod may be mounted in the screen section with either flat side uppermost and when so mounted its greatest width is on the line 7. Consequently the narrowest width of the space between adjacent rods is located a substantial distance below the top surfaces of the rods so as to permit relatively large parts of the rods to wear away without increasing the effective width of the spaces between said rods. Further, due to the fact that the narrowest portions of said spaces are only a relatively short distance below the tops of the rods, the edges of pieces of material passing over the screen, or small corners or projections thereon, can enter the larger upper portions of the spaces and thus engage and dislodge any small fragments which may have wedged in those spaces. The flat lateral surfaces on the lower parts of the rods provide beneath the narrow portions of those spaces an ample clearance for the escape of such material as passes through the spaces.

In assembling the rods in a screen section of this kind it is essential that the rods should be accurately positioned with relation one to the other and firmly retained in those positions during the welding operation. For this purpose it is customary to provide a positioning bar, or bars, 11 extending transversely to the rods and provided in its upper edge with notches or recesses 12 extending lengthwise of the rod. These notches are of a size and shape to receive the

individual rods and to accurately position the same with relation one to the other. To hold the rods against relative displacement during the welding operation a bar 13 is clamped across the upper surface of the rods. Owing to the very small size of the rods the seating of the same in the notches of the positioning bar is in many instances a slow and tedious operation when the rods are of irregular form. When the rods are round they may be easily positioned in the recesses by simply pushing them along the positioning bar. The present rod is so shaped that the several rods can be seated in the respective recesses with substantially the same speed and accuracy as the round rods. This is due to the fact that any one of the three lateral surfaces of the rod may constitute the top surface and to the fact that the rod is so shaped that the three sections thereof formed by lines extending through the longitudinal center or axis of the rod and through the respective apices of the triangle will be substantially equal in size and shape. When such a rod is moved along the positioning bar the foremost corner thereof will enter one of the recesses, and the bar will seat itself in the recess by gravity, the rounded corners of the rod facilitating this movement thereof. The recesses are so shaped that when the rod has seated itself therein it will be accurately positioned with relation to the other rods and when the clamping bar 13 is applied the several rods will be firmly held against displacement prior to or during the welding operation.

While I have shown and described one embodiment of my invention I wish it to be understood that I do not desire to be limited to the details thereof as various modifications may occur to a person skilled in the art.

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

1. A screen comprising supporting members and a plurality of rods supported on said members in laterally spaced relation, each rod having a cross sectional shape approximating an equilateral triangle having its apices cut away to provide the rod with three substantially flat lateral surfaces of substantially equal width and with three relatively narrow outwardly curved corner surfaces, each rod being mounted on said supporting members with one corner surface lowermost and in contact with said members, the upper lateral surfaces of all of said rods being substantially in a common plane and the spaces between adjacent rods having their narrowest portions substantially in a plane spaced a substantial distance below the first mentioned plane.

2. A screen comprising a plurality of rods spaced laterally one from the other and each having a cross sectional shape approximating an equilateral triangle having its apices cut away on radii substantially coincident with but of less length than the radii extending from the longitudinal center of said rod to the respective apices of said triangle, and supporting members spaced apart lengthwise of said rods, each rod being supported on said members with one corner surface lowermost and in contact with said members and with its upper surface substantially in a plane common to the upper surfaces of all of said rods.

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