

June 21, 1960

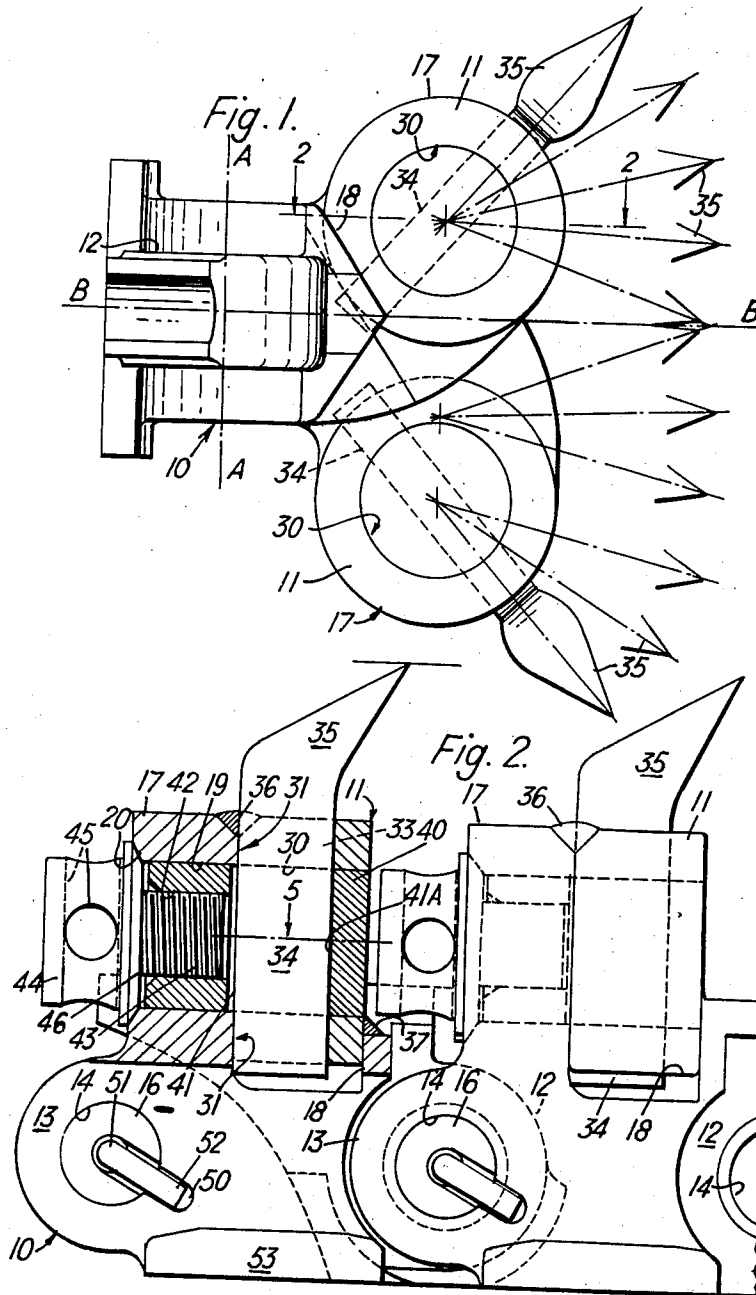
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2,941,789

PICK BOXES FOR CUTTER CHAINS OF MINING MACHINES

Filed Feb. 14, 1958

3 Sheets-Sheet 1



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Fig. 3.

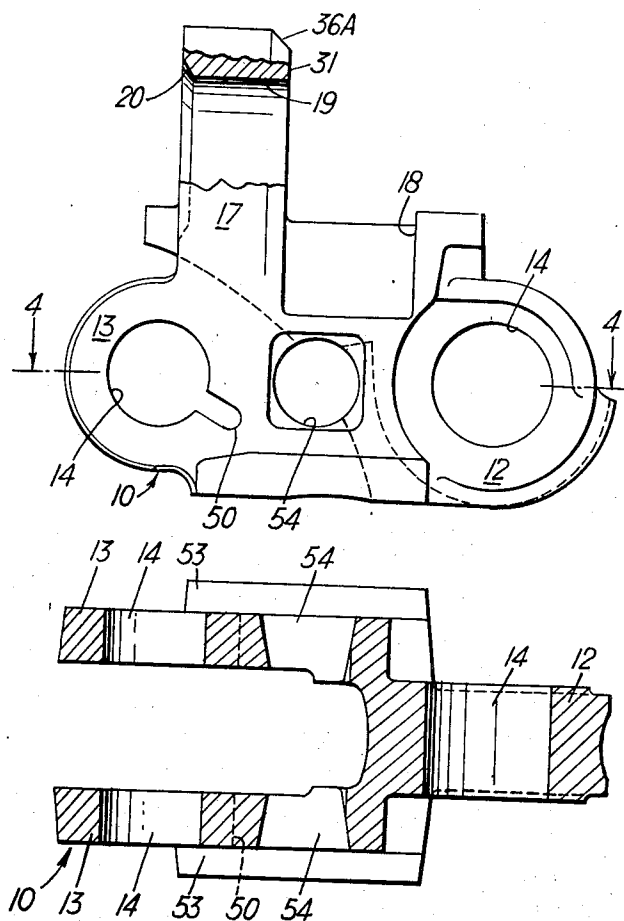
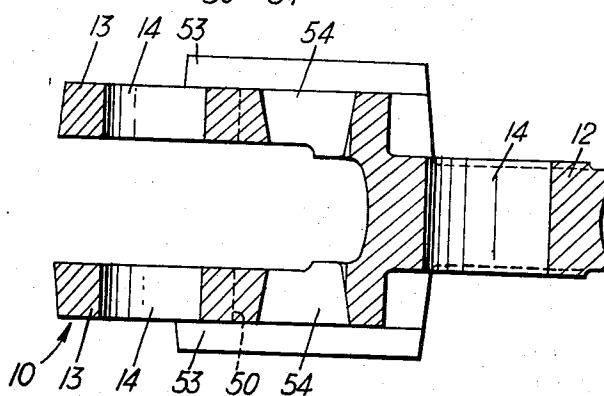


Fig. 4.



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Fig. 5.

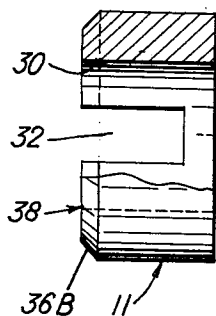


Fig. 6.

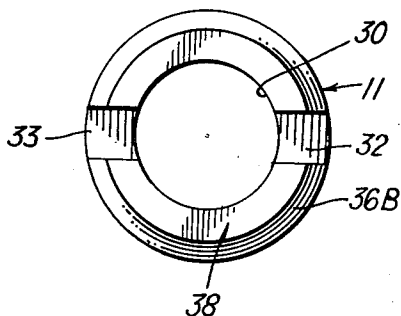


Fig. 7.

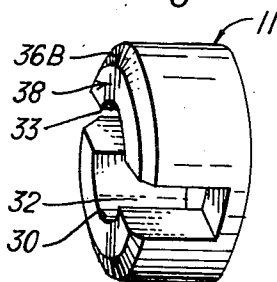


Fig. 8.

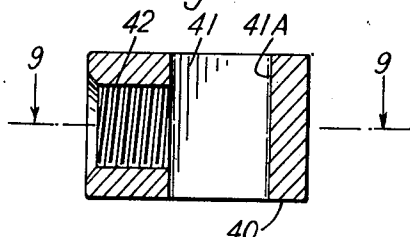
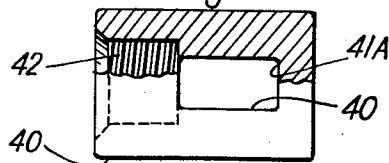


Fig. 9.



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## PICK BOXES FOR CUTTER CHAINS OF MINING MACHINES

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5 Claims. (Cl. 262—33)

This invention relates to pick boxes of the type which are adapted to be linked together to form a cutter chain for cutting out a kerf in a coal or other mineral seam and which have sockets adapted to receive the shanks of picks serving as the cutting means.

When using such a chain for cutting a kerf in a coal face, it is customary to have adjacent picks mutually inclined to cut the coal face in vertically spaced horizontal planes, the total number of cutting planes being determined by the depth of kerf desired. For example, a standard kerf is cut by variously inclined picks cutting in ten planes, whereas a wide kerf may be cut in twelve planes. It follows that the sockets in adjacent pick boxes are also mutually inclined. Previously, in providing pick boxes having variously inclined sockets, it has been customary to use as many different prototypes as there are different socket inclinations. Thus, for a standard kerf cutter chain one would require a set of ten prototypes according to which the requisite pick boxes would be forged; for a wide kerf cutter chain the set would comprise say twelve prototypes.

It is an object of the present invention to simplify the manufacture of pick boxes of the type stated by reducing the number of prototypes required.

The invention is a pick box of the type stated which is of composite construction and which comprises a link component adapted to be linked with the link components of other pick boxes and a complementary separately made holder component which is rigidly secured to said link component and which has a recess to serve as a socket for a pick.

The recess is formed with an open side which is closed by a complementary face of the link component in the finished composite pick box.

Preferably, said holder component is formed as a cylinder with a transverse recess in one end and said link component is formed with a lug having a side complementary to the recessed end of said holder component.

Means for locking the shank of a pick in the socket may comprise a plug to receive which the link component and the holder component are made with co-axial bores, said plug having a transverse socket to register with the pick-receiving socket and having a screw-tapped hole for a locking screw to grip the shank between opposed faces of the plug and holder component.

The invention also is a method of manufacturing a pick box of the type stated which method comprises forming a link component adapted to be linked with the link components of other pick boxes, separately forming a holder component with a recess to serve as a socket for a pick, bringing together the two formed components in a pre-determined relationship to give a desired inclination of the socket, and securing the two components in said relationship as a composite pick box.

An example of a pick holder according to the invention is shown in the accompanying drawings, in which:

Fig. 1 is a side view of two adjacent pick holders.

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Fig. 2 is a corresponding plan, the view being partly in section on the line 2—2 of Fig. 1.

Fig. 3 is a view corresponding to Fig. 2 of the link component of one of the pick holders, the view being partly in section.

Fig. 4 is a section on the line 4—4 of Fig. 3.

Fig. 5 is a view partly in section of a holder component as viewed in Fig. 2.

Fig. 6 is an end view and Fig. 7 a perspective view of the holder component.

Fig. 8 is a section of a locking component of the pick holder as viewed in Fig. 2.

Fig. 9 is a corresponding view partly in section on the line 9—9 of Fig. 8.

In Fig. 1, the pick boxes are shown as though in working position in a coalcutter chain; that is to say, the axes of the joints inter-connecting the link components lie in the vertical plane A—A. The link components themselves as shown are lying generally in a horizontal plane B—B.

Each link component 10 has a single horizontal middle web 12 at one end and two vertically spaced horizontal side webs 13 at the other end, all of said webs having holes 14 to receive vertical pins 16 by which the link component is pivotally attached to other similar link components in the coalcutter chain. The link component also has a laterally extending lug 17 which bridges the side webs alongside their holes 14 and which is offset, being shown curved, either upwards or downwards from the general plane B—B of the link component, depending upon whether the pick box is to be used in cutting the upper or the lower half of the kerf. In Fig. 2 the lug 17 is shown curving upwards; a corresponding downwards curving lug 17 is also shown. The side webs 12 are also bridged by a shallow arcuate seat 18 which joins them with the middle web 12. The lug is rounded to a substantially semi-circular form as Fig. 1 shows. A horizontal concentric bore 19 is provided in the lug. The outer end of the bore is counter-sunk to provide a conical thrust face 20.

The pick holder component 11 is a cylindrical sleeve, the bore 30 of which has the same diameter as the lug bore 19. The outer radius of the sleeve is equal to the radius of the rounded lug so that the sleeve fits snugly against the flat inner side face 31 of the lug. The sleeve is formed, in the example, with diametrically aligned recesses 32, 33 in its inner end, each recess being defined by three rectangular sides as Figs. 5, 6 and 7 show. The recesses 32, 33 serve as a socket for receiving the shank 34 of a pick 35.

The composite pick box is made by fitting the pick holder component 11 to the link component 10 with the sleeve resting in the arcuate seat 18 and abutting against the inner face 31 of the lug 17, the bores 19, 30 registering co-axially. Moreover, the sleeve is set with its recesses 32, 33 appropriate to the desired socket inclination. The sleeve is welded at one end, at 36, around its periphery to the lug and at its other end, at 37, to the shallow arcuate seat. The lug and sleeve are bevelled at 36A and 36B to adapt them for welding. A fourth side of the socket formed by the recesses 32, 33 is defined by the inner side face 31 of the lug in contact with the recessed flat end face 38 of the sleeve. That is to say, the recesses 32, 33 are each formed with an open side and this is closed in the finished pick box by the face 31 of the link component 10.

The pick locking component is a cylindrical plug 40 adapted to be slid into the co-axial bores 30, 19 of the lug and sleeve and having a transverse socket 41 adapted to register with the socket formed by the closed recesses 32, 33. One face of the socket is indicated by 41A. The plug also has a screw-tapped hole 42 in one end to receive

a locking screw 43, the head 44 of which has transverse holes 45 to receive a bar for turning the screw. The head of the screw has a conical flange 46 adapted to fit the thrust face 20.

The arrangement is such that the plug 40 is fitted into the co-axial bores 30, 19 with the socket 41 in register with the recesses 32, 33, the locking screw 43 being slackened back. Then a pick is inserted into the pick box with the shank 34 fully entered into the total socket 32, 41, 33. On tightening of the screw so that the flange 46 bears hard against the thrust face 20, the opposed faces 31 and 41A are drawn hard against the pick shank and lock it.

As Fig. 1 shows, in one pick box the lug 17 curves upwards from the link component 10 whereas the lug 17 of the other pick box curves downwards. In Fig. 1 there are also shown the tips of sets of picks 35 to illustrate the various inclinations at which the picks may be fixed. By way of illustration, the upwards curved lug 17 and the other similar lugs of the cutter chain are arranged for a standard kerf cutter chain, whereas the downwards curved lugs are arranged for a wide kerf cutter chain.

It will be apparent that, as regards all the link components 10 of a complete chain of pick boxes, only two prototype forgings are necessary, one having the lug 17 upturned and the other having the lug downturned, as Fig. 1 shows; as regards the pick holder components 11, only one prototype forging is necessary, as Figs. 5 to 7 show. With such three prototype forgings, together with appropriate locking components, such as the parts 40, 43, any required number of composite pick boxes can be made and can be linked together as a cutter chain having picks at say ten or twelve or any other practicable number of inclinations.

In the example, the link components 10 are formed with slots 50 which radiate from the holes 14 through the side webs 13. The slots are provided to accommodate small locking pins 51 which are inserted through central holes in the joint pins 16 and bent over at their ends 52 to engage the slots. These locking pins are known contrivances for holding the joint pins 16 in position.

Moreover, the link components are formed with customary lateral flanges 53 which serve to guide the cutter chain in its travel around the jib which carries it.

As shown only in Figs. 3 and 4, holes 54 may be formed in the link component to reduce the amount of metal.

I claim:

1. A pick box comprising a link component adapted to be linked with other link components of other pick boxes to form a cutter chain, an offset arcuate lug which is an integral portion of said link component, said lug presenting a flat face, a circular holder component welded to said lug, said holder component also presenting a flat face which registers with and abuts against the flat face of the lug, a diametrical pick-receiving recess in the face of the holder component, which recess is closed by the face of the lug and which is set at a selected angular relationship therewith, registering circular bores in the lug and holder component respectively, said bores being co-axial with the holder component, and means inserted into said bores for locking a pick in the pick-receiving socket.

2. A pick box according to claim 1 in which the means for locking a pick in the pick-receiving socket comprise a circular-section plug fitting into both of the registering circular bores, said plug having a transverse socket to

register with the pick-receiving recess in the face of the holder component and having a screw-tapped hole extending co-axially through said plug into said transverse socket, and a locking screw to grip the pick between the flat face of the lug and an opposed face of the transverse socket.

3. A pick box comprising a link component adapted to be linked with other link components of other pick boxes to form a cutter chain, an offset lug which is an integral portion of said link component, said lug presenting a flat face, a holder component secured to said lug, said holder component also presenting a flat face which abuts the flat face of the lug, registering bores in the lug and holder component respectively, a transverse pick-receiving recess in the face of the holder component, which recess is closed by the face of the lug and which is set at a selected angular relationship therewith, a plug fitting into both of said registering bores, said plug having a transverse socket to register with said pick-receiving recess and having a screw-tapped hole extending co-axially through said plug into said transverse socket, and a locking screw to grip the pick between the flat face of the lug and an opposed face of the transverse socket.

4. A pick box comprising a link component adapted to be linked with other link components of other pick boxes to form a cutter chain, an arcuate lug which is an integral portion of said link component, said lug presenting a face, a circular holder component secured to said lug, said holder component also presenting a face which registers with and abuts against the face of the lug, registering bores in the lug and holder component respectively, a diametrical pick-receiving recess in the face of the holder component, which recess is closed by the face of the lug and which is set at a selected angular relationship therewith, a plug fitting into both of said registering bores, said plug having a transverse socket to register with said pick-receiving recess and having a screw-tapped hole extending co-axially through said plug into said transverse socket, and a locking screw to grip the pick between the face of the lug and an opposed face of the transverse socket.

5. A pick box comprising a link component adapted to be linked with other link components of other pick boxes to form a cutter chain, a lug which is an integral portion of said link component, said lug presenting a face, a holder component secured to said lug, said holder component also presenting a face which abuts the face of the lug, registering bores in the lug and holder component respectively, a transverse pick-receiving recess in the face of the holder component, which recess is closed by the face of the lug and which is set at a selected angular relationship therewith, a plug fitting into both of said registering bores, said plug having a transverse socket to register with said pick-receiving recess and having a screw-tapped hole extending co-axially through said plug into said transverse socket, and a locking screw to grip the pick between the face of the lug and an opposed face of the transverse socket.

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