

May 29, 1956

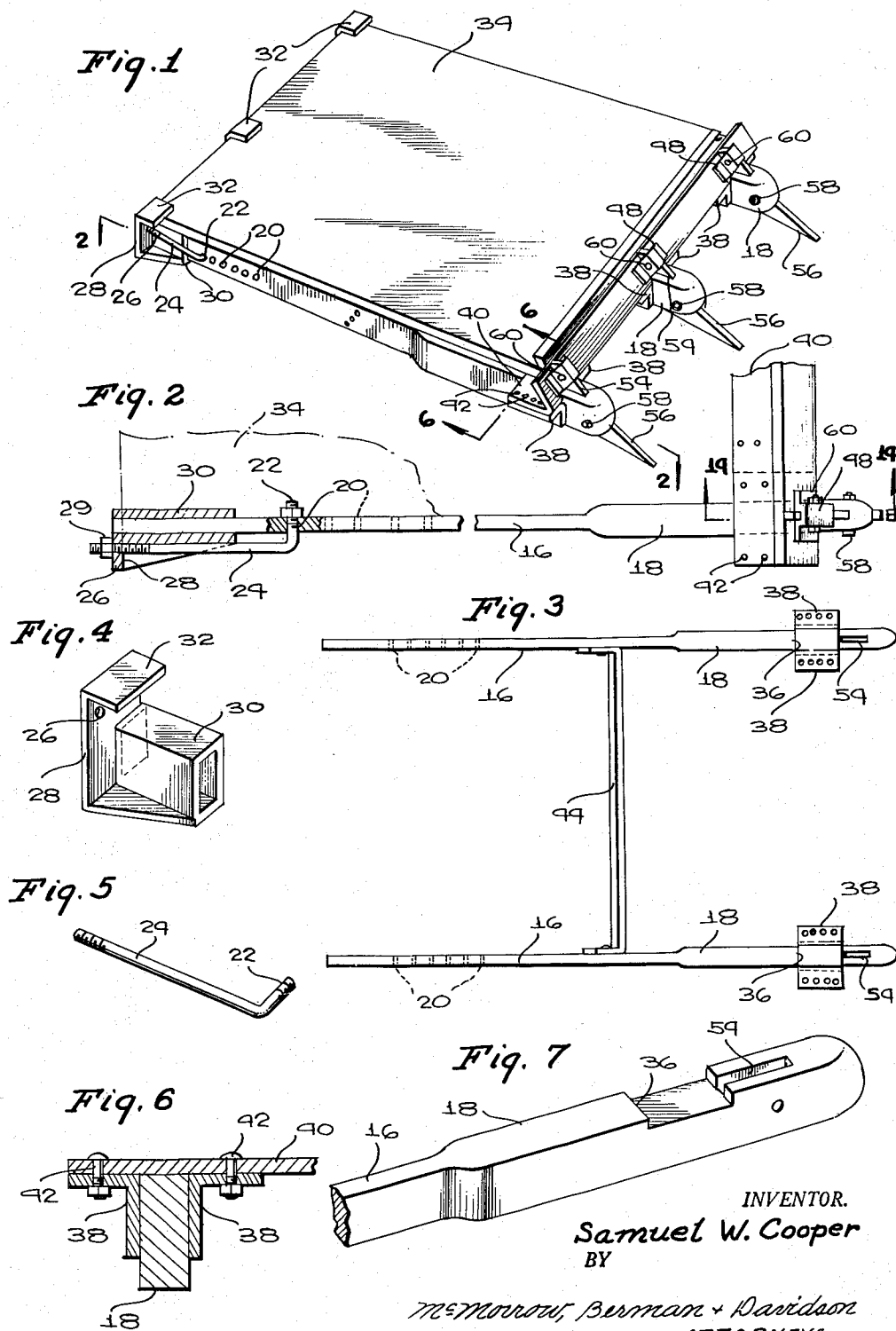
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2,747,309

COMBINATION RIPPER ATTACHMENT FOR SCRAPERS AND BULLDOZERS

Filed May 29, 1953

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 8

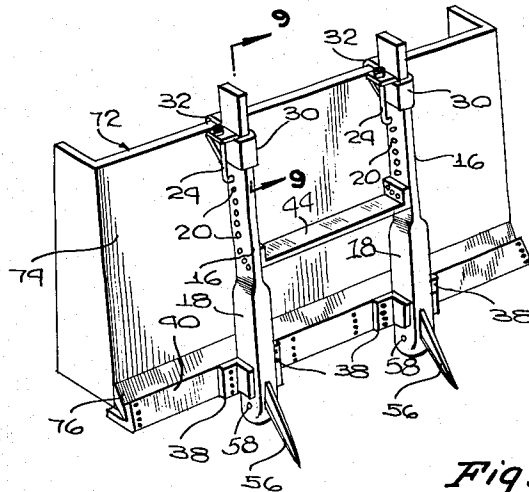


Fig. 9

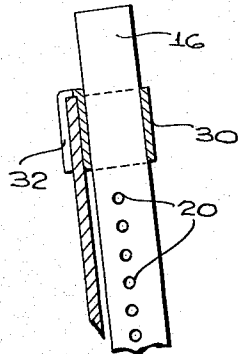


Fig. 10

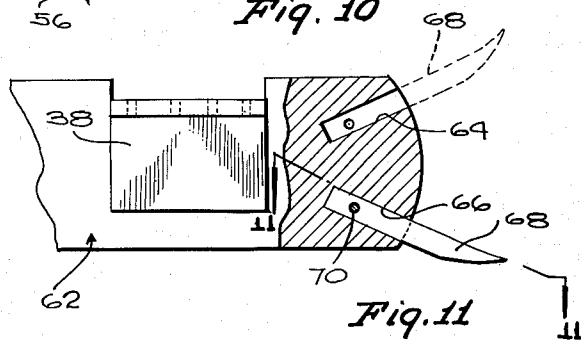


Fig. 11

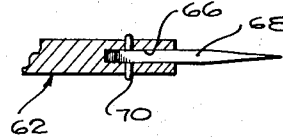


Fig. 12

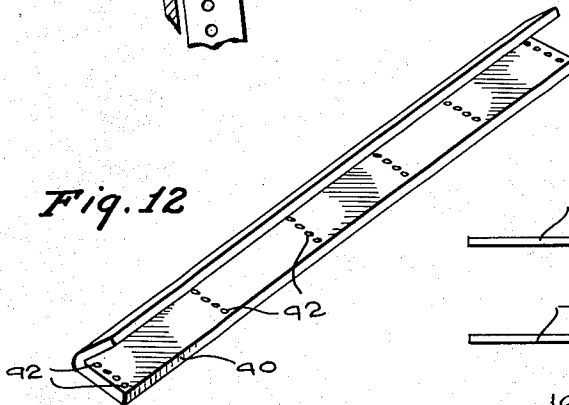


Fig. 13

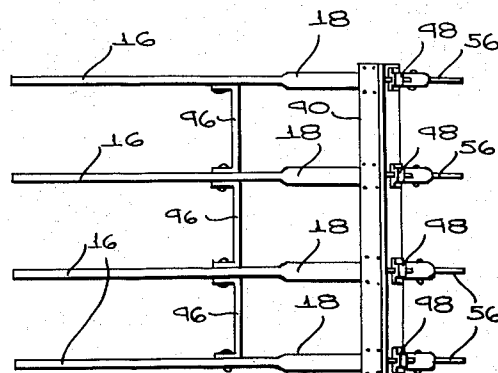
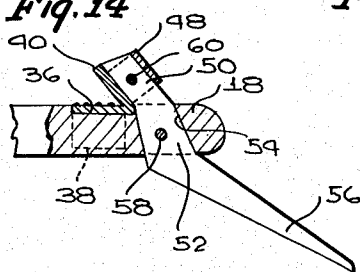


Fig. 14



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1

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COMBINATION RIPPER ATTACHMENT FOR SCRAPERS AND BULLDOZERS

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2 Claims. (Cl. 37—145)

This invention relates to earth moving equipment, and more particularly, has reference to an attachment for a scraper, bulldozer, or "pan," which attachment is adapted to rip hard shale or other earth formations that resist movement by the conventional blade means of the earth-handling equipment. The attachment constituting the present invention, thus, constitutes a means removably connectible to earth-handling equipment of the type stated, which means is adapted to prepare the earth for subsequent handling by conventional bladed devices already known in the art.

In many instances, the capacity of heavy earth moving equipment is reduced sharply, when hard formations such as shale, rock, hard earth, and the like are encountered. In such instances, the blade means generally provided upon the equipment is unable to penetrate the earth to an extent effective to move a sufficient quantity of the earth.

The main object of the present invention is to provide a ripper attachment for a blade means of the type stated, which ripper attachment will include a plurality of ripping teeth so disposed as to penetrate hard earth, shale, rock, etc., and break the same up in a way that will permit the blade means of the earth moving equipment to subsequently move and distribute the material with appreciable speed and ease.

Another object of importance is to provide an attachment as described which can be secured to or removed from the blade means of a scraper or bulldozer with considerable ease, thereby to permit the attachment to be brought into use or laid aside with a minimum loss of time, according to the needs of the particular situation.

Another object of importance is to provide a ripping attachment as described which will be so designed as to permit the attachment to be connected to blades of various sizes, the attachment being rigidly secured in each instance to the blade means supporting the same.

Another object is to provide a ripper attachment, as described wherein the means for connecting the attachment to the blade assembly of the associated piece of earth moving equipment will be such as to permit adjustment, to insure that the attachment will be firmly and immovably connected to the blade assembly in every instance, regardless of the length of the particular blade assembly on which the attachment is being mounted.

Another object of importance is to provide an attachment as described which can be mounted on blade assemblies that are either substantially horizontal or substantially vertical, as for example, the blade assemblies of scrapers and bulldozers respectively.

Still another object is to provide an attachment as stated in which a plurality of identically formed ripper bars can be fixedly connected in transversely spaced relation, said bars being usable in selected quantity, for the purpose of adjusting the overall width of the attachment.

Other objects will appear from the following description, the claims appended thereto, and from the annexed

2

drawings, in which like reference characters designate like parts throughout the several views, and wherein:

Figure 1 is a perspective view of a ripper attachment formed in accordance with the present invention, as it appears when associated with the blade assembly of a scraper;

Figure 2 is an enlarged longitudinal sectional view taken substantially on line 2—2 of Figure 1, the blade assembly of the scraper being illustrated fragmentarily and in dotted outline;

Figure 3 is a top plan view of a pair of the ripper bars, per se;

Figure 4 is an enlarged perspective view of one of the clamps;

Figure 5 is a perspective view of a clamp bolt used with the Figure 4 clamp;

Figure 6 is a transverse sectional view, on an enlarged scale, taken substantially on line 6—6 of Figure 1;

Figure 7 is a fragmentary perspective view of one of the ripper bars, per se;

Figure 8 is a perspective view showing the attachment of the present invention applied to the moldboard of a bulldozer, but with the ripper bars having the under faces facing to the front;

Figure 9 is an enlarged, fragmentary, sectional view taken on line 9—9 of Figure 8;

Figure 10 is a fragmentary sectional view through the front end portion of a modified form of ripper bar;

Figure 11 is a sectional view on line 11—11 of Figure 10;

Figure 12 is a perspective view of a cross member used for fixedly connecting the ripper bars in transversely spaced relation;

Figure 13 is a top plan view of a multiplicity of the ripper bars connected in transversely spaced relation; and

Figure 14 is an enlarged, detail sectional view taken on line 14—14 of Figure 2.

The reference numeral 16 has been applied in the drawings to designate ripper bars or beams, said bars being formed identically to one another, with each bar being provided with an elongated shank merging at the front end of the bar into a thickened front end portion 18.

Adjacent the rear end of each ripper bar 16, there is formed in the bar a longitudinal series of openings 20, in any selected one of which is engageable a lateral extension 22 formed upon one end of a clamp bolt 24. Clamp bolt 24 is threaded at its opposite ends, that end of the clamp bolt remote from the extension 22 being slidably engaged in a smooth walled opening 26 formed in a plate-like body 28 of a clamp (Figure 4), said body being provided, along one edge thereof, with a forwardly projected flange 32. Rigidly secured to the plate-like body 28 of each clamp is a socket 30 of open ended formation, the socket being formed to a cross sectional shape complementing that of the associated ripper bar shank.

By reason of this arrangement, it will be observed that the plurality of the ripper bars 16 can be spaced transversely of an earth-engaging member 34 of a scraper or similar piece of earth moving equipment, with the flanges 32 hooking over the back edge of the scraper, at selected locations spaced transversely of the same.

The ripper bars will underlie the earth-engaging member 34, extending fully from end to end of said member, and by threading nuts 29 on the clamp bolts 24, said clamp bolts and their associated ripper bars will be drawn longitudinally of the member 34. It will be understood, in this connection, that the lateral extensions 22 of the respective clamp bolts 24 can be positioned in any one of the openings 20, the selected opening de-

pending upon the particular length of the member 34 on which the attachment is to be mounted.

In the thickened front end portion of each bar 16 there is formed a shallow, transverse recess 36, and welded or otherwise fixedly secured to the opposite sides of the front end portion, and aligned with said recess, are angle iron brackets 38, each bracket 38 being formed with a plurality of openings as best shown in Figure 3.

A cross member 40 extends transversely of the several ripper bars 16, said cross member seating in the recesses 36 of the ripper bars. It will be understood that each recess 36 would be formed to a depth equal to the thickness of the leg of the cross members seating therein, each recess 36 having a width equal to the width of said seated leg.

The cross member 40 is formed to the cross sectional shape of an acute angle as best shown in Figure 14, and at locations spaced longitudinally of the cross member 40, said cross member has transverse rows of openings, adapted to be registered with the openings of the brackets 38 for extension of connecting bolts therethrough. The openings of the cross member have been designated by the reference numeral 42, and it will be readily apparent that the particular spacing of the several transverse rows of openings 42 is such as to permit ripper bars to be secured to the cross member at any of various locations, according to the number and spacing found appropriate for the ripper bars in a particular instance on which the attachment is to be used.

The cross member 40 would be of any length desired. When only one ripper bar is being used, the cross member would be only long enough to hold the bar rigidly against the bulldozer or scraper blade. Longer cross members may be made to accommodate two or more ripper bars, as desired. The ripper bars whether one or more are used, may be welded to the cross member instead of being bolted as shown, if a permanent attachment is desired.

It will be understood that suitable means will be employed to cross brace the several ripper bars, and in Figure 3, there is illustrated a cross brace 44, the ends of which are secured by bolts or equivalent fastening elements to the bars 16, medially between opposite ends of said bars. The cross brace 44 is detached from the ripper bars, and short cross braces 46 can be employed (Figure 13), whenever a substantial number of ripper bars is to be employed, with the bars to be spaced transversely of one another relatively short distances.

On the upwardly extending leg of the cross member 40, there are mounted brackets 48, the brackets 48 being formed from lengths of bar material bent to define rectangular openings in which are engageable the shank ends 50 of digging or ripping teeth 52, removably engaged in transverse slots 54 of the several ripper bars (Figure 14). The ripping teeth or standards 52, at those ends thereof remote from the shank ends 50, terminate in elongated, pointed ripping blades 56, which ripping blades will be extended obliquely to the ripper bars 16, when the attachment is in use.

The ripping teeth or standards are removably but fixedly connected to their associated ripper bars 16, and after extension of the standards through the slots 54 and brackets 48, bolts or pins 58, 60 are employed to secure the standards in proper position relative to the ripper bars.

In Figure 10, there is illustrated a modified form of ripper bar, wherein the ripper bar has been designated generally by the reference numeral 62, and is formed, at its front end, with sockets 64, 66, either of which is adapted to receive the shank end of a ripping tooth 68. The ripping tooth 68, when inserted in a selected socket, is secured fixedly within said socket by a transversely extending bolt or pin 70.

The construction illustrated in Figures 10 and 11 may be particularly well suited for association with the mold-

boards of bulldozers, although it is not essential that the construction shown in Figure 1 be departed from, when the attachment is to be mounted upon a bulldozer. The attachment is shown mounted upon a bulldozer in Figure 8, the reference numeral 72 being applied generally to a conventionally shaped moldboard of a bulldozer, which moldboard has a plate-like body portion 74 and a blade portion 76. It will be noted that the body 74 and blade portion 76 constitute an earth-engaging member, in the same manner as the scraper bottom shown in Figure 1 constitutes an earth-engaging member.

In mounting the attachment upon the moldboard of a bulldozer, the ripper bars 16 are disposed substantially vertically, in front of said moldboard, and are spaced transversely of the moldboard as desired, it being understood that any number of ripper bars can be used. The clamps carried by the shank ends of the ripper bars are formed identically to those used when the ripper bars are to be connected to the scraper bottom 34, and it will be observed that said clamps will hook over the top edge of the moldboard 72. The cross member 40, meanwhile, will receive the blade portion 76 of the bulldozer moldboard, the digging teeth 56 being inclined downwardly and forwardly from the moldboard, so as to be properly disposed for penetrating and ripping the earth.

When the attachment is used as in Figure 1, the cross member 40 will receive the cutting edge of the earth-engaging member or scraper bottom 34, with the clamps being secured to the back edge of said scraper bottom in the manner previously described herein.

In either instance, the ripping teeth or standards 56 are adapted to rip the earth, in such a manner as to properly condition the earth for subsequent handling or moving thereof by the scraper bottom 34 or bulldozer moldboard 72, as the case may be.

Of course, the ripping teeth or standards can be properly hardened at their earth-penetrating ends to withstand wear. Alternatively, the standards can be formed to receive removable teeth. Or, removable teeth can be mounted upon the standards even when said standards are specially hardened. This is believed sufficiently obvious as not to require special illustration.

It is believed apparent that the invention is not necessarily confined to the specific use or uses thereof described above, since it may be utilized for any purpose to which it may be suited. Nor is the invention to be necessarily limited to the specific construction illustrated and described, since such construction is only intended to be illustrative of the principles of operation and the means presently devised to carry out said principles, it being considered that the invention comprehends any minor change in construction that may be permitted within the scope of the appended claims.

What is claimed is:

1. A ripping attachment for earth moving equipment of the type having a plate-like, earth-engaging member, comprising: a plurality of ripper bars extendable adjacent said member; clamp means at one end of each of said bars engageable with one edge of said member, for effecting a fixed connection of the bars to the member, said clamp means including a plate-like body engageable against said edge of the earth-engaging member, a flange on said body adapted to hook over said edge, said body having an opening, a socket connected to said body in which the associated ripper bar is slidably engaged, the ripper bar having a plurality of longitudinally spaced openings, and an L-shaped clamping bolt having a lateral extension at one end engaged in a selected opening of the ripper bar, the other end of the bolt being slidable in the opening of said plate-like body and having a take-up nut threaded thereon against said body, for adjusting the ripper bar longitudinally of said body; a cross member extending between the respective bars and proportioned to engage the opposite

5

edge of said member; and ripping tooth means on the several ripper bars.

2. A ripping attachment for earth moving equipment of the type having a plate-like, earth-engaging member, comprising: a plurality of ripper bars extendable adjacent said member; clamp means at one end of each of said bars engageable with one edge of said member, for effecting a fixed connection of the bars to the member; a cross member extending between the respective bars and proportioned to engage the opposite edge of said earth-engaging member; and ripping tooth means on the respective ripper bars, the clamp means of each bar including a flat plate extending transversely of the bar and having an area greater than the cross sectional area of the bar, said plate having an opening, the bar having a longitudinal series of openings, a clamp bolt of L-shape having both ends threaded, one end extending through a selected opening of the bar and the other end extending through the plate opening, nuts threaded

6

on the ends of the bolt, one of said nuts bearing against the plate and constituting a take-up nut for adjusting the bolt in the direction of its length within the plate opening, said clamp means including a flange formed on one edge of the plate adapted to hook over an adjacent edge of said earth-engaging member, and a tubular socket formed open at both ends and having a cross sectional shape approximating that of the bar, said socket being rigid at one end with the plate, the bar being slidably and removably engaged in said socket.

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