

March 12, 1957

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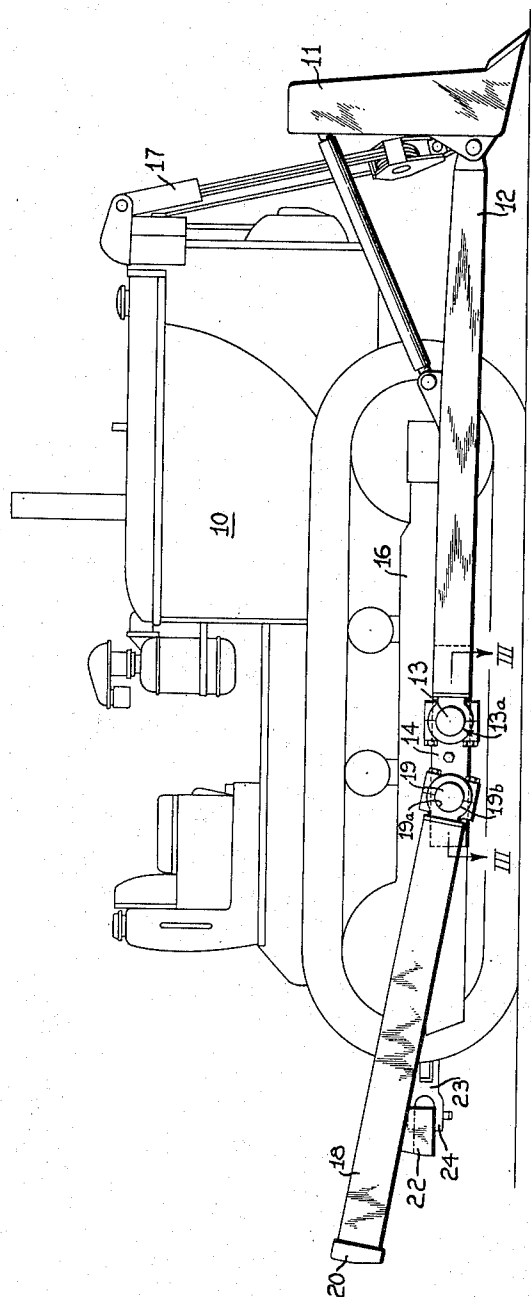
2,784,508

TANDEM PUSHER ATTACHMENT FOR TRACTORS

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3 Sheets-Sheet 1

FIG. 1--



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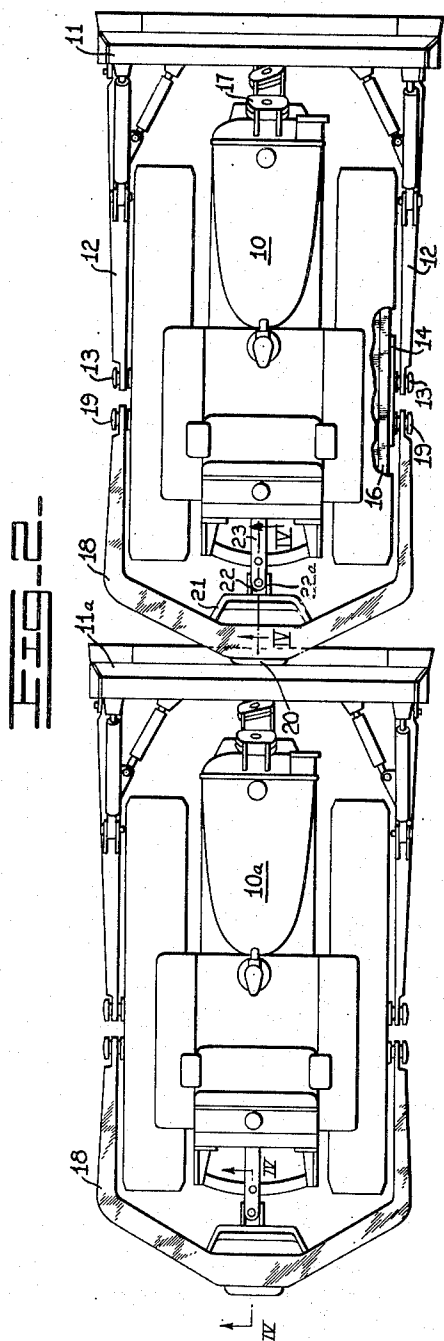
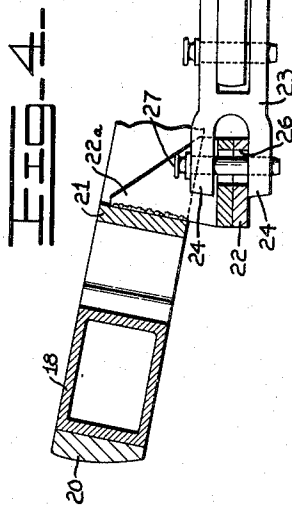
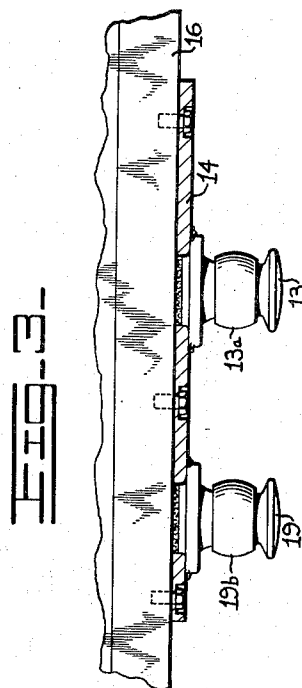
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3 Sheets-Sheet 2



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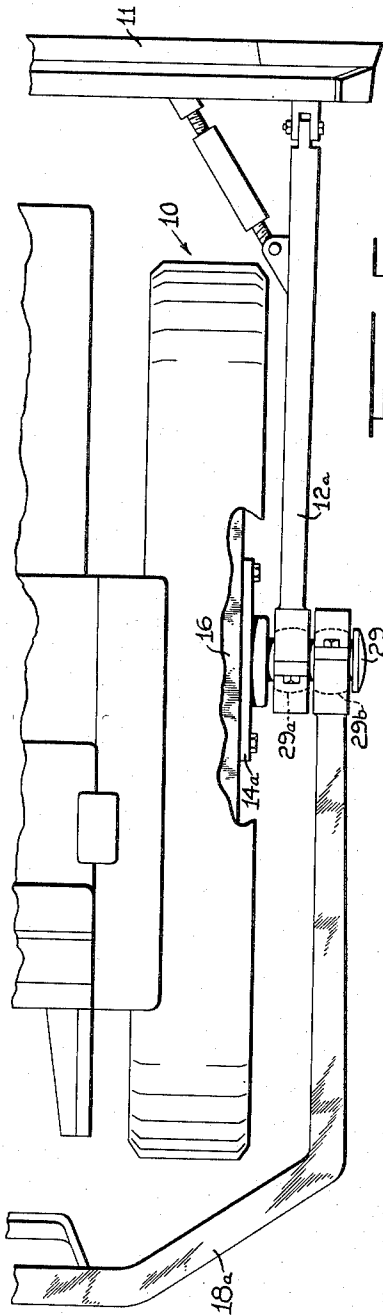


FIG. 5-

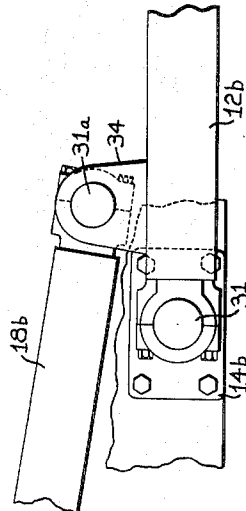


FIG. 6-

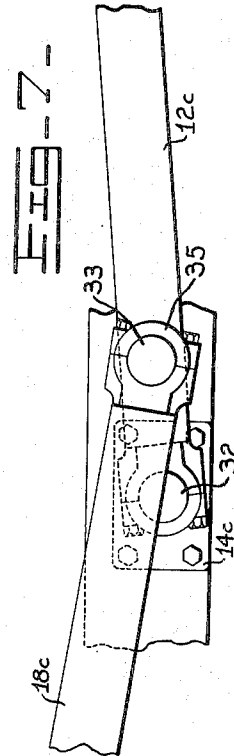


FIG. 7-

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TANDEM PUSHER ATTACHMENT FOR TRACTORS

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1 Claim. (Cl. 37—144)

This invention relates generally to bulldozers and principally to an attachment for a bulldozer for use in push loading earth moving equipment such as scrapers. It is common practice in earth moving to aid the loading of a scraper and insure full loading thereof by bringing the bulldozer blade of a so-called pusher tractor into engagement with a suitable push block on the rear of the scraper during the loading operation to augment the power of the scraper engine. In certain types of soil a second pusher tractor is brought into engagement with the first pusher during the last part of the scraper loading cycle to further assist in the loading operation.

The disadvantage of present pusher methods is that when additional force is required to completely fill the scraper bowl and two units are used in tandem, the second pusher tractor transmits its forces directly through the main frame of the first pusher tractor, causing distortion of the powering elements thereof, thereby tending to set up excessive stresses throughout the drive members. It is, therefore, the principal object of this invention to provide an attachment for a bulldozer equipped tractor that will enable another tractor to assist in a pushing operation without imposing undue stresses on the first tractor.

Another object of this invention is to provide a unit not limited in its use to pusher operations alone but which can function as a separate unit in performing other duties while not utilized as a pusher.

Other objects and advantages of this invention are made apparent in the following specification wherein a preferred form of the invention is described in detail by reference to the accompanying drawings.

In the drawings:

Fig. 1 is a side elevation of the pusher attachment embodying the present invention associated with a bulldozer and illustrated as mounted on a track type tractor;

Fig. 2 is a plan view showing two such pusher units in tandem arrangement;

Fig. 3 is a partial section taken along the line III—III of Fig. 1;

Fig. 4 is a partial section taken along the lines IV—IV of Fig. 2;

Fig. 5 is a partial plan view illustrating a modification of a trunnion assembly employed in the invention with parts broken away to show the details of the structure thereof;

Fig. 6 is a fragmentary view in side elevation of a second modification of the trunnion assembly; and

Fig. 7 is a similar view illustrating another modification of the trunnion assembly.

Referring to Figs. 1 and 2 of the drawings, a conventional track type tractor, generally indicated at 10 is disclosed as having a bulldozer blade 11 provided with a pair of spaced push arms 12 supported on trunnions 13 which are carried by trunnion plates 14 fixed one to each side of a main frame 16 of the tractor 10. Arms

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12 are connected at their forward ends to bulldozer blade 11 in the usual manner and at their rearward ends to trunnions 13 as by ball and socket connections indicated at 13a. A conventional cable control 17 is provided for adjusting the elevation of the bulldozer blade 11.

A U-shaped frame 18 embraces the rear portion of tractor 10. The forward ends of said frame are connected to trunnions 19 also carried by the plates 14. These connections are also in the form of ball and socket joints comprising semi-spherical sockets 19a embracing semi-spherical parts 19b. A push block 20 is shown as carried by the rear portion of U-frame 18 for purposes to be described.

To support U-frame 18 at the desired elevation so as to contact the bulldozer blade 11a of a second pusher unit 10a in tandem arrangement, frame 18 is provided with a cross member 21 which supports a pad 22 secured thereto as by U-shaped bracket 22a. A conventional drawbar 23 extends rearwardly from tractor 10 and is shown in Fig. 4 as having a bifurcated end 24 adapted to receive pad 22 and bracket 22a. An elongated hole 26 is formed in the pad and bracket to receive a retaining pin 27 which serves to secure frame 18 to the drawbar 23. The elongation of hole 26 prevents external forces applied at pusher block 20, by a second pusher tractor, from being transmitted through said drawbar into the main frame 16 of the first pusher tractor, even though frame 18 deflects as a result of such external forces.

When two units are used in tandem in push loading operations, the bulldozer blade 11a of the rear pusher tractor 10a will contact push block 20 on the frame 18 of tractor 10 and exert forces through said frame 18, trunnion 19, trunnion plate 14, trunnion 13, push arms 12 and bulldozer blade 11 without creating adverse stress conditions within the main frame of the tractor 10.

Fig. 5 illustrates a modification of the trunnion arrangement wherein a trunnion plate 14a supports a single outstanding trunnion 29 with two ball connections 29a and 29b to support the forwardly extending push arms 12a and the rearwardly extending U-shaped frame 18a respectively.

Fig. 6 illustrates a second modification of the trunnion arrangement which may be utilized in this structure. Here a trunnion plate 14b supports a single trunnion 31 to which is connected, as by the usual methods, a push arm 12b. A pair of spaced upstanding ears 34 are fastened as by welding, to push arms 12b to receive a second trunnion 31a to which the forward ends of frame 18b are connected.

A third modification of a trunnion member is illustrated in Fig. 7 wherein the trunnion plate indicated at 14c is disclosed as having a trunnion 32 extending therefrom to support, in any well-known manner, push arms 12c. A second trunnion 33 extends outwardly from the arm 12c to receive a ball and socket connection 35 of frame 18c. In all of the modifications shown in Figs. 5, 6 and 7, pushing forces acting upon frame 18 are transmitted through said trunnion arrangements to push arms 12a, 12b or 12c without producing undesirable stresses in the main frame of the first pusher tractor.

I claim:

In combination with a tractor having a rearwardly extending drawbar and a forwardly extending bulldozer frame adapted to be employed in pushing operations, and a second frame extending rearwardly of the tractor to present a surface for engagement by a second pushing tractor, a thrust imparting connection between said

frames, and a connection between the second frame and the drawbar of the first tractor to hold the frame at a desired elevation, said connection including a drawbar pin extending through the drawbar and a part on the frame, said part on the frame having an enlarged opening for reception of the drawbar pin to prevent pushing stresses from being transmitted through the drawbar to the first tractor.

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