May 23, 1939. E. W. AUSTIN 2,159,347

TAMPING MEANS

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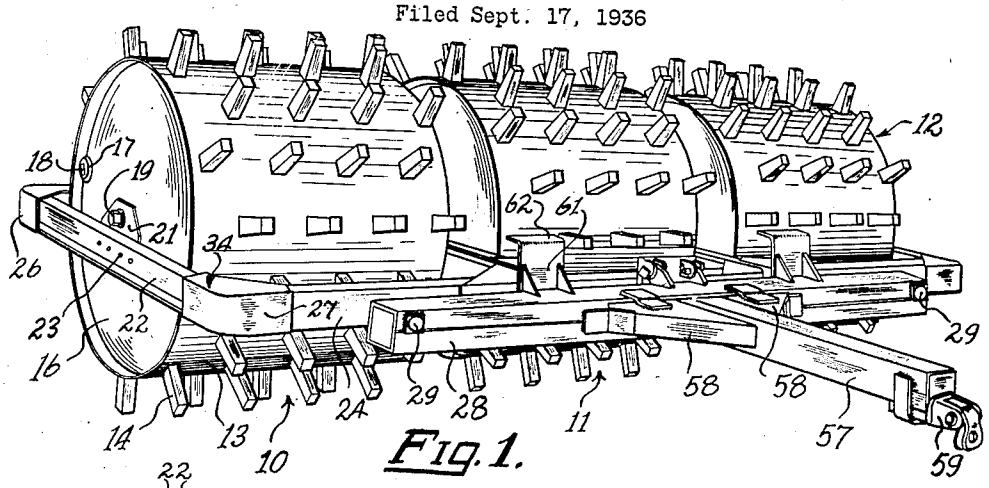

FIG. 1.

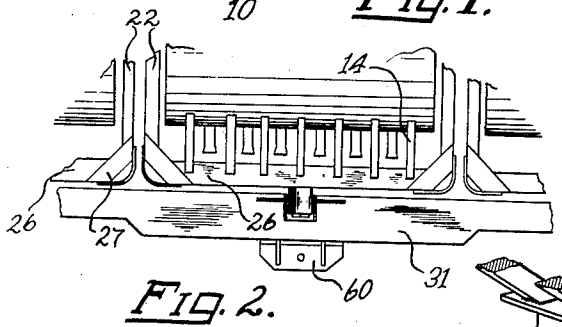

FIG. 2.

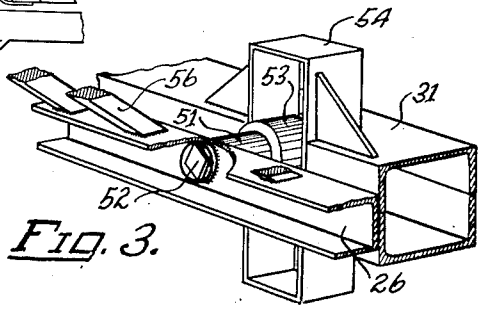

FIG. 3.

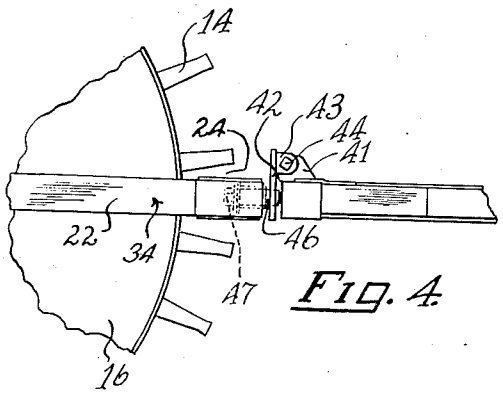

FIG. 4.

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TAMPING MEANS

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11 Claims. (Cl. 55—47)

This invention relates to earth tamping devices and has particular relationship to means for mounting a plurality of tamper rollers in a framework which may be towed by tractor or like vehicle.

It has become customary in the compacting of earth and the like as in earth fills, road beds, etc., to employ heavy rollers, the peripheries of which are provided with radially-extending bars or lugs and to draw these rollers over the earth to cause the lugs to compact the material. The rollers or drums are preferably hollow and may be filled with water or sand to give them a heavy mass and means are provided for draining the water or sand so that the rollers may be easily transported.

In devices known to the prior art, one or, at the most, two rollers were employed and it was only necessary to pivotally attach the rollers to the draw bar structure. In this manner and in the case of two rollers, if one of the rollers was rolling over a ridge, it would rise and tilt at the same time without effecting the position of the other roller, relative to the ground.

The tractive devices employed in earth moving operations have become more and more powerful from year to year and economy and competition have made it more and more desirable that larger earth moving and earth working devices be devised.

It has become extremely desirable that more than two rollers be employed for compacting materials in order to secure economy of operation, but difficulty arises in mounting the rollers in a suitable framework. The ordinary method of mounting these rollers by pivotally attaching them to the framework is not satisfactory for the reason that one of the rollers may be higher than the other two and will tend to lift one or the other of the remaining rollers, thereby causing excessive strains in the frame and draw bar.

I have devised a means for mounting a plurality of rollers in a framework which obviates these difficulties.

One of the objects of my invention is to provide means for mounting a plurality of rollers in a framework to permit independent or floating movement of the rollers.

Another object of my invention is to provide means for cleaning the rollers and tamper teeth.

Other and further features and objects of my invention will be more apparent to those skilled in the art upon a consideration of the accompanying drawing and following specification, wherein is disclosed a single exemplary embodiment of the invention, with the understanding, however, that such changes may be made therein as fall within the scope of the appended claims, without departing from the spirit of the invention.

In said drawing:

Figure 1 is a view in perspective of a tamper constructed in accordance with one embodiment of my invention.

Figure 2 is a fragmentary plan view of the middle roller and means for engaging it to the cross beam at the rear of the tamping device.

Figure 3 is a fragmentary view in perspective of the means employed for engaging the middle roller to the cross beam at the rear of the rollers. Portions of the structure have been broken away to show the remaining parts to greater advantage.

Figure 4 is a fragmentary view in side elevation of the means for engaging the middle roller to the draw bar.

Referring now to the drawing, the rollers indicated generally at **10**, **11** and **12** are of the usual construction and are comprised of cylindrical rolls **13**, having a plurality of radially disposed lugs or tamper bars **14**, secured thereto as by welding. These bars may also be termed "sheep's teeth" or tamper teeth. The cylindical walls **13** are of relatively heavy plates formed in cylindrical form and with the abutting edges welded together in accordance with the usual practice. The ends of the cylinders are closed by means of discs **16**, which are preferably welded in place to form a closed cylinder. One of each of the end walls **16** is provided with a threaded opening indicated at **17** and this opening may be closed by means of bungs indicated at **18** in order that the cylinder may be filled with water. Each cylinder has an axle **19** through its axis and this axle is rotatably mounted in suitable brackets **21** at each end thereof. The brackets **21** are riveted to the side members **22** of a surrounding framework, as by means of rivets **23**. The surrounding framework, indicated generally by the numeral **34**, is rectangular in form and has front and rear cross members **24** and **26**. These members are joined to the side members **22** at the corners by means of curved corner members **27**, all in accordance with the usual practice.

The two end rollers **10** and **12** are pivotally engaged to a draw bar across beam **28** at the front of the device, by means of stub shafts **29** (Fig. 1). The rectangular roller surrounding frameworks of the two outside rollers **10** and **12** are pivotally

attached to a cross beam 31 at the rear of the device, by means of other stub shafts, (not shown) this being in accordance with the usual practice. The outside or end rollers may rotate about on the stub shafts 29 and thus the two end rollers may readily adjust themselves to the inequalities of the ground. It is apparent however, that a pivotal connection such as employed with the end rollers cannot be employed for inside rollers such as the roller indicated at 11, for the reason that if any of the rollers were raised above the others, they would tend to lift at least one of the remaining rollers with consequent strain on the cross bars 28 and 31. I have, therefore, devised what may be termed a "floating" or independent connection for intermediate rollers such as the roller 11 and this connection contemplates providing a universal means for attaching the surrounding frame 34 with the remaining cross bar. A preferred universal connection for the framework 34 is illustrated in Figures 1 and 4 and a preferred sliding engagement means is illustrated in Figures 2 and 3.

A preferred universal connection employs spaced ears 41 projecting upwardly from the center of the cross beam 28, a plate 42, having forwardly projecting ears 43 which are pivotally engaged to the ears 41 by means of a pin 44 to permit the plate to pivot about on a transverse axis, afforded by the pin 44. The plate 42 is pivotally engaged to the framework 34 by means of a stub shaft 46 and this stub shaft passes through the front member 24 of the framework 34 and is secured therein by means of the nut 47. The frame 34 may pivot about in its longitudinal axis on the pin 46 and about a transverse axis on the pin 44.

It is apparent that the rear or opposite end of the framework 34 must be enabled to move up and down independently of the cross beam 31 if the middle roller 11 is to have independent or floating movement with regard to the other rollers. In order to accomplish this result I preferably provide a shaft 51, which is engaged in the rear cross member 26 of frame 34 by means of a bolt 52 and the shaft 51 has a large roller 53 rotatably mounted on the end thereof. The cross beam 31 is cut away to receive this roller, a vertically-extending box frame 54 is placed in this cut-away portion and this box member affords a guide for the roller 53 which permits the roller 53 to move up and down in the box member but restrains any sidewise motion of the roller and consequently of the roller framework 34. The cross beam 26 of the surrounding framework 34 is preferably provided with cleaner teeth 56 in accordance with the usual construction and these teeth may project at an angle with regard to the cross beam 26 and into the space between the lugs 14, whereby earth and other material will be removed from the rollers as the rollers are rotated.

The front cross beam 28 is attached to a drawbar 57 by welding it thereto and heavy corner braces 58 are provided to furnish a strong structure or towing means which will prevent the drawbar from weaving when the device is being drawn over the ground. Coupling of the tongue 57 to the towing device (not shown) is accomplished by means of the universal coupler 5 at the front end of the drawbar. The cross beam 31 at the rear of the device may be provided with a rearwardly extending platform or drawbar 60 for towing other equipment if desired.

A pair of bracket members 61 are provided on the rear of the cross beam 28, having rearwardly projecting flanges 62 adapted to engage the corners of adjacent roller frames on excessive tilting thereof to prevent the rollers from turning over.

It is apparent that a device constructed according to my invention permits pivotal connection of the end rollers to the cross beam structures and a combined universal and sliding connection of intermediate rollers to the cross beams to permit independent movement of intermediate rollers.

It is quite apparent also that any number of intermediate rollers may be employed and that with a coupling device constructed according to my invention these intermediate rollers may move independently of the end rollers.

It is apparent that modifications of my invention may be made by those skilled in the art and such modifications may be made without departing from the spirit and scope of the appended claims.

I claim as my invention:

1. Coupling means for coupling at least three rollers to a towing vehicle in substantially coaxial alignment, including rollers, a frame for each of the rollers, a towing means common to all of the frames of all the rollers, and means for permitting independent movement of the intermediate rollers including a universal joint connection between one side of the frame of the roller and the towing means, and a means for preventing lateral relative motion between the other side of the frame and towing means.

2. In a tamper, a plurality of rollers, a frame for each one of the rollers, cross beams front and rear of the rollers and common to all of the rollers, the end rollers being pivotally attached to the cross beams, and the intermediate rollers having a universal joint connection with front cross beam and sliding connection with the rear cross beam to permit independent floating movement thereof.

3. In a tamper having a plurality of rollers, cross beams, front and rear of the rollers, frames surrounding the rollers, pivotal connections connecting the frames of at least two rollers front and rear with the cross beams and means for connecting the frames of another roller to the cross beams comprising a universal connection with one of the cross beams and a vertically disposed sliding connection for the other of the cross beams.

4. In a tamper having a plurality of rollers, a frame for one of the rollers, a towing means and means for connecting the towing means with the frame comprising a pivotal connection in the frame for permitting pivotal movement about a longitudinal axis of the tamper, and a plate engaged to the pivotal connection and pivotally engaged to the towing means for permitting pivotal movement of the plate about a transverse axis of the tamper, to thus permit vertical motion of the frame relative to the towing means.

5. In a tamper, a roller, a frame for the roller, a cross beam at the rear of the roller, coupling means at the rear of the roller comprising a vertically extending guide in the cross beam and a roller pivotally engaged on the roller frame adapted to be received in the vertically extending guide.

6. In a tamper, rollers, a frame for one of the rollers, cross beams front and rear of the rollers, a universal connection for attaching the frame to one of the cross beams comprising a pin rotatably mounted in one of the frames and a plate having a pivotal connection with the cross beam

for movement about a transverse axis, and means for attaching the frame to the rear cross beam comprising a guide and roller, whereby the front connection permits the frame to pivot about longitudinal and transverse axes but restrains vertical movement thereof and whereby the rear connection permits vertical movement but restrains sidewise movement thereof.

7. A tamping roller for compacting earth materials comprising a toothed roller, a frame about the roller, front and rear cross beams, a drawbar, universal mounting for the frame on the front cross beam and means in connection with the rear cross beam to allow the roller limited free movement in a vertical direction with respect to the drawbar.

8. In a tamper, rollers, a frame for one of the rollers, a rear cross beam, and means for guiding the frame in a vertical direction comprising a sliding connection for attaching the frame to the cross beam.

9. In a tamper having a plurality of rollers, individual frames on the rollers, a main frame extending in front of and behind the roller frames, towing means pivotally attached in front of the roller frames for towing them, and a means at the rear of at least one roller frame and a means on the main frame adapted to slidably engage therewith to permit vertical relative motion and pivotal movement of the roller frame about said means.

10. In a tamper roller for compacting earth materials, a frame, a roller rotatably mounted within said frame, front and rear cross beams, means for attaching the frame to the cross beams including a roller on the frame, and a guide on one of the cross beams to restrict lateral motion of the frame with respect to the cross beams.

11. In a tamper, rollers, a frame for one of the rollers, front and rear cross beams, means for guiding the roller comprising a universal joint for attaching the frame to the front beam, and a vertically sliding connection between the frame and rear cross beam on the side of the frame opposite the universal joint.

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