Dec. 19, 1933. M. L. FYKSE ET AL 1,939,684

CREEPING TRACTION

Original Filed Sept. 11, 1930 2 Sheets-Sheet 1

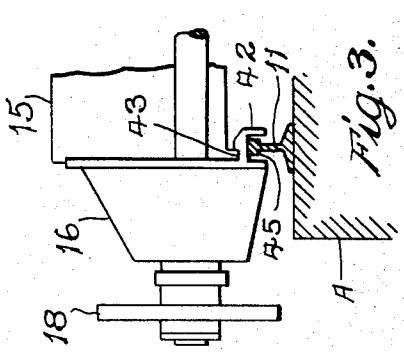


Fig. 3.

Fig. 1.

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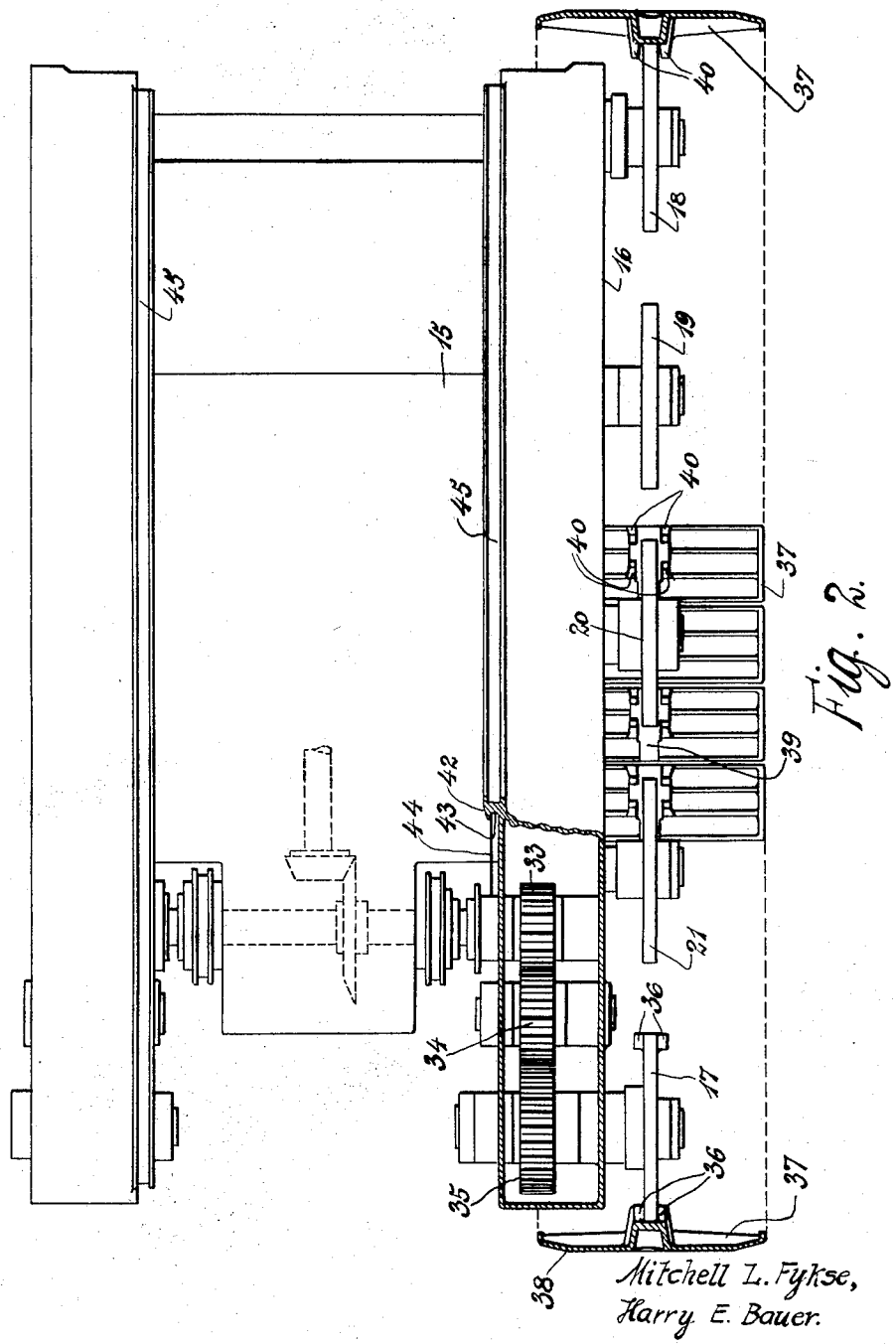


Fig. 2.

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1,939,684

CREEPING TRACTION

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Original application September 11, 1930, Serial No. 481,164. Divided and this application September 10, 1931. Serial No. 562,124

9 Claims. (Cl. 214—152)

Our invention relates to new and useful improvements in creeping traction.

This application is a division of our application Serial No. 481,164, filed September 11, 1930, for improvements in creeping traction.

Our principal object is to provide a creeping-traction mounting for excavators, cranes and the like, which shall possess in operation a base wider than railroad clearance for shipment.

It has been proposed in the past to solve this problem by building the traction-device so that its wheels will fall just within railroad clearance, and its treads will extend beyond railroad clearance. Then, for shipping, the treads are removed, and the wheels are run onto special rails on a flat car.

But this is only a makeshift solution. In the first place, this requires the use of special rails. And, in the second place, this solution limits the wheel-base not only to the railroad clearance, but also to the width of the flat-car, which is always less than railroad clearance.

It is our object to permit the use of a wheel-base beyond the limit of the width of a flat-car, and to employ ordinary railroad rails on the car.

Further objects are to take the strain off the running gear during railroad travel, and to devise a novel method of loading.

In addition to our principal object, we have worked out a number of novel and useful details, which will be readily evident as the description progresses.

Our invention consists in the novel parts, and in the combinations and arrangements thereof, which are defined in the appended claims: and of which one embodiment is exemplified in the accompanying drawings, which are hereinafter particularly described and explained.

Throughout the description, the same reference number is applied to the same member or to similar members.

Referring to the drawings, it will be seen that:

Figure 1 shows in outline an excavator, as loaded according to our method, for transportation.

Figure 2 is a plan view, taken from below, showing details of our creeping traction mechanism.

Figure 3 is a section of one side of the excavator of Figure 2, in its mounted position, taken along the line 3—3 of Figure 1.

Beginning at Figure 1, it will be seen that 10 is a railroad track, upon which are stationed a flat car, A, intended for the excavator proper, and a second flat car, B, upon which the accessories are to be placed.

Car A has securely fastened to its upper surface a pair of rails, 11, spaced apart as hereinafter determined, upon which the excavator 12 is to be loaded in the manner hereinafter described.

We have also provided a ramp 13, with rails 14 securely fastened to its upper surface, the rails being spaced apart the same distance as the rails 11 on car A, so that, when the ramp is positioned, the upper end of rails 14 may abut the ends of rails 11. In the preferred form, the ramp has a steeper slope at the ground-engaging end, the slope at the car-engaging end being small enough that the excavator 12 may remain thereon without sliding.

The excavator consists of the usual base 15, with creeping traction members, of which Figure 1 shows only the side-frame 16, the tumblers 17 and 18 and the rollers 19, 20, 21; inasmuch as the tread-belt (not shown in Figure 1) is to be removed before the excavator is placed in the position shown.

The upper portion 22 of the excavator 12, is capable of being revolved about the base 15, and carries a deck 23, for the placing of the usual actuating machinery, such as the winch-drum 24, for actuating the hoist cable (not shown) which passes to a sheave at the point of the boom 25. The boom is shown as already detached, and laid upon the car, B.

The only other appliance carried by the deck with which our invention is concerned is the A-frame 26, which is made collapsible in order to diminish the head-room required in shipping. Member 27 of the A-frame is pivoted at 28 to the support of the winch-drum 24, and to its other end 29 is pivoted the member 30. The lower end of 30 is fastened to a yoke-shaped member 31, by a removable pin 32. The A-frame is collapsed by removing pin 32, and disposing the members as shown by the dotted lines, the member 27 being laid in the yoke of member 31.

Turning now to Figure 2, we have shown the side frames 16 as carrying on shafts the driving tumbler 17, idler tumbler 18, and rollers 19, 20, 21. Power is conveyed from the engine (not shown) to the driving tumbler 17, by a succession of gears, 33, 34, 35.

The driving tumbler 17 is provided with laterally projecting lugs 36, for driving engagement with the tread belt links, 37.

Each tread-belt link 37 is provided with a relatively broad tread, or ground-engaging, surface, 38. Its upper surface has, centrally disposed, a relatively narrow, flat, wheel-engaging surface, 39. At each side of this surface 39 is an upstand-

ing flange 40, having its central part cut away for the extrusion of dirt, these flanges being for driving cooperation with the laterally projecting lugs 36 on the driving tumbler 17. The lugs 36 on the driving tumbler 17 and the flanges 40 are relatively so placed that, when the tread-belt curves about the tumbler, lugs 36 fall between the flanges 40 of successive links. The above-enumerated features of the tread-belt links are more particularly described in copending application, Serial No. 299,071 of Snyder, filed Aug. 11, 1928.

The load-supporting rollers, 19, 20, 21, and the idling tumbler 18, are disposed to run over the same narrow wheel-engaging channel 39 in which the driving tumbler runs.

As shown on Figure 2, the lower, inner edge of each side frame 16, has along its length a heavy flange 42, which is provided, on its upper surface, with a groove 43, into which a downwardly projecting flange 44 on the base 15, is stepped. A groove 45 extends along the lower surface of the flange 42. At the ends of the side-frames 16, the grooves 45 are somewhat curved vertically upward, to allow the easier placing on the rails of the ramp.

The distance between the grooves 45 of the two side-frames 16 determines the distance between the rails 11 on car A, and the same distance between the rails 14 of the ramp; so that, when the excavator is set upon the ramp or upon car A, the grooves 45 will fit over the rails 11 or 14 respectively.

Our invention contemplates the possibility of making an excavator of such large size that, when completely assembled, it will not be within railroad clearances; yet, when only a very few of its members are dismounted, leaving the excavator still capable of locomotion under its own power, the machine can then be shipped by rail, without further disassembling.

For shipping purposes, we propose to remove the tread-belt 37, the dipper and handle (not shown), and the boom 25. When pin 32 is withdrawn from the yoke-shaped member 31 of the A-frame, and the A-frame is collapsed into the position shown in Figure 1 by dotted lines, the machine is ready for shipment.

The order of shipping operations is as follows:

The two flat cars, A and B, are placed a short distance apart.

The excavator is run up to the side of car B, and the dipper and handle are loaded on B.

The ramp 13 is set at the end of car A, in such a position that the rails on the ramp are continuous with those on the car. The ramp is then bolted to the car.

Car A is then anchored to the railroad rails by any convenient means. The outside girders of car A may be propped in any convenient manner, as by ties or preferably jacks. The wheels of the car are blocked, as by chocks placed inward of the inner wheels of the trucks.

The excavator is then propelled to the lower end of the ramp, and is positioned so that the grooves 45 on the under side of the side-frame line up with the rails of the ramp. It is then run up as far on the ramp as it will go, which will be until the traction belt makes insufficient contact with the ground to propel the machine further.

In this position, the grooves 45 on the underside of the excavator engage the rails 11 of the ramp in the same manner as they are shown, in Figure 3, engaging the rails of the car, and the excavator bears the same relation with respect to the rails of the ramp as it bears in Figure 1 with respect to the rails of the car.

The traction belt is then disconnected, by removing the connecting pin between two links at that end of the upper reach of the belt which is nearer to car A. The upper reach of the traction belt is then laid back on the ground.

Loading tackle is then attached to some convenient point on the front of the machine and to some convenient point on the further end of the car, and the cable is attached to the winch drum 24.

This cable is then used to haul the machine up on the ramp and upon the car. During this process the rails are greased to facilitate sliding.

Car B is then brought sufficiently near that the excavator may be used as a crane for loading the various detachable parts upon car B.

The tread belt is loaded on car B.

The ramp is unbolted and loaded on car B.

The excavator is then hauled, by means of the loading tackle, to the center of car A, so that the excavator occupies the position shown in Figure 1. It will be noted that the tumblers 17, 18 and the rollers 19, 20, 21 of the excavator hang clear of engagement with the car A or with anything else. The two cars are coupled together. The boom is swung towards car B, and lowered upon ties placed on car B to receive it.

The A-frame is lowered as hereinbefore described, using any convenient lowering means, such as gin-pole and cable.

The machine is then blocked for shipment.

For unloading, these operations are reversed, except that the rails on car A and on the ramp are sanded instead of greased.

Having now described and illustrated one form of our invention, we wish it to be understood that our invention is not to be limited to the specific form or arrangement of parts hereinbefore described, except in so far as such limitations are specified in the appended claims.

We claim:

1. In combination with a creeping-traction vehicle, having rail-engaging means on its under side; an articulated endless tread-belt, adapted to encircle the running-gear of the vehicle, and adapted to be disconnected at an articulated joint; a shipping conveyor; and a shipping track of ordinary railroad rails thereon, adapted to support the vehicle; the tread-belt extending outwardly beyond the running-gear, and the shipping-track extending outwardly not so far as the running-gear.

2. The process of preparing creeping-traction vehicles for railroad shipment, which consists in: moving the vehicle into such position that its under-frame is supported by a ramp, and its treads are clear of the ground; disconnecting and removing the tread-belt; sliding the vehicle up the ramp to a position on the railroad car, with the under-frame of the vehicle supported by shipping-tracks on the car; and removing such parts of the vehicle as extend beyond the railroad clearance limits.

3. The process of preparing creeping-traction vehicles for railroad shipment, which consists in: moving the vehicle into such position that its under-frame is supported by a ramp, and its treads are clear of the ground; sliding the vehicle up the ramp to a position on the railroad car, with the under-frame of the vehicle supported by shipping-tracks on the car; and removing such

parts of the vehicle as extend beyond the railroad clearance limits.

4. In combination: a railroad flat-car of such size as to fall within railroad clearance; a creeping-traction vehicle, having its tread-belt of such size as, when mounted on a railroad car, to extend beyond railroad clearance, and having rail-engaging means on its under side within its wheels; the remainder of the vehicle falling within railroad clearance; and a shipping-track on the car, adapted to support the vehicle at the rail-engaging means thereof, so as to utilize, to the fullest extent, the available railroad clearance, even beyond the width of the car.

5. In combination: a railroad flat-car of such size as to fall within railroad clearance; a creeping-traction vehicle, having its tread-belt of such size as, when mounted on a railroad car, to extend beyond railroad clearance, and having rail-engaging means on its underside within its wheels; and a shipping-track on the car, adapted to support the vehicle at the rail-engaging means thereof.

6. In combination: a railroad flat-car of such size as to fall within railroad clearance; a creeping-traction vehicle, having its tread-belt of such size as, when mounted on a railroad car, to extend beyond railroad clearance, and having rail-engaging means on its underside within its wheels; some of the traction wheels of the vehicle falling within railroad clearance; and a shipping-track on the car, adapted to support the vehicle at the rail-engaging means thereof, so as to utilize, to the fullest extent, the available railroad clearance, even beyond the width of the car.

7. In a creeping traction vehicle, the combination of: two running gears; two articulated tread-belts, one adapted to encircle each of the running gears, and adapted to be disconnected at an articulated joint; and two means, each extending lengthwise of the vehicle, and between the two running gears, adapted to rest on a rail, and thereby support the weight of the vehicle for shipment.

8. In a creeping-traction vehicle, the combination of: two running gears; two articulated tread-belts, one adapted to encircle each of the running gears, and adapted to be disconnected at an articulated joint; and two grooves, each extending lengthwise of the vehicle, and between the two running gears, adapted to rest on a rail, and thereby to support the weight of the vehicle for shipment.

9. In combination with a creeping-traction vehicle; two articulated endless tread-belts, adapted to encircle the running gears of the vehicle, and adapted to be disconnected at an articulated joint; two lengthwise grooves on the underside of the vehicle, within the running gear; a shipping conveyor; and a shipping track of ordinary railroad rails thereon, adapted to engage the grooves to support the vehicle; the tread-belts extending outwardly beyond the running-gears.

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