

July 4, 1939.

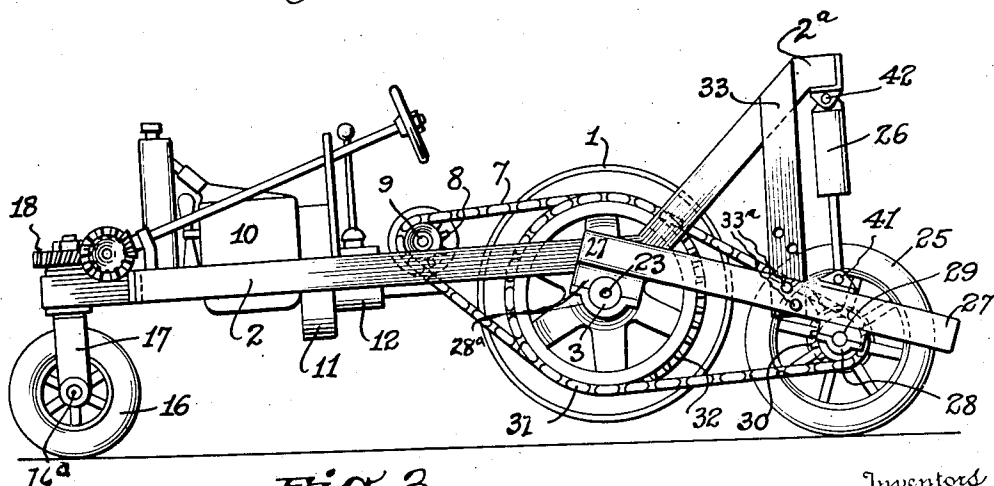
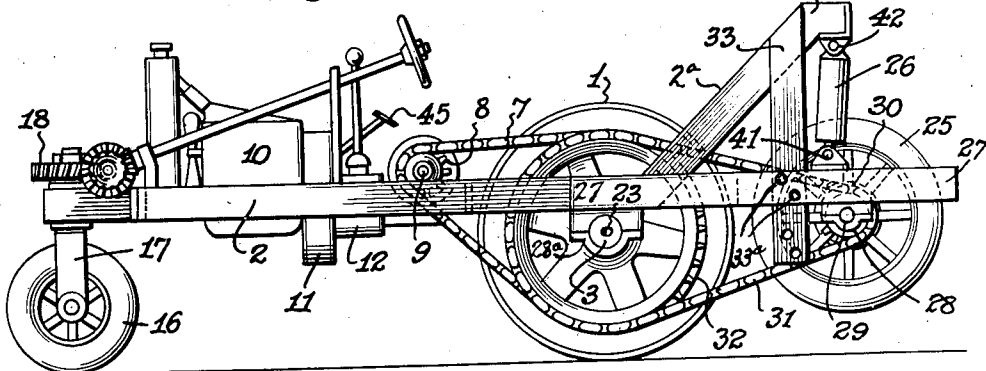
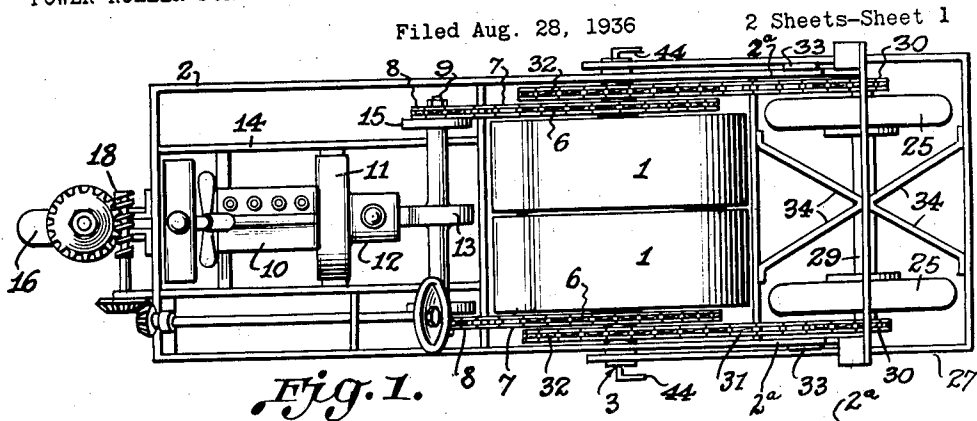
B. C. STEED ET AL

2,164,845

POWER ROLLER FOR COMPACTING MATERIALS USED IN VARIOUS TYPES OF SURFACING

Filed Aug. 28, 1936

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

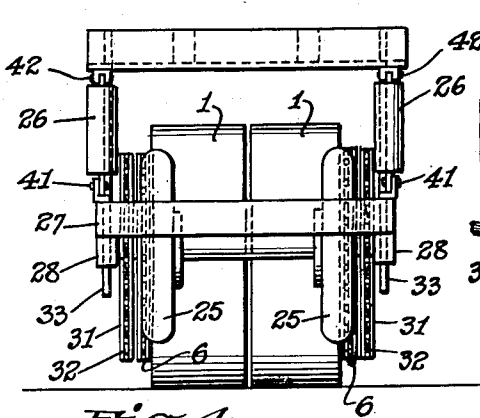


Fig. 4.

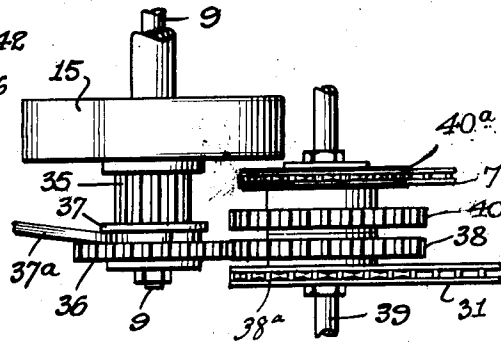


Fig. 5.

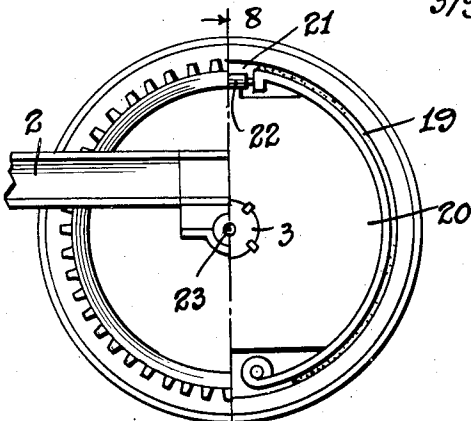


Fig. 7.

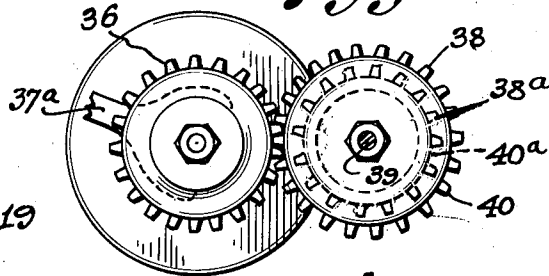


Fig. 6.

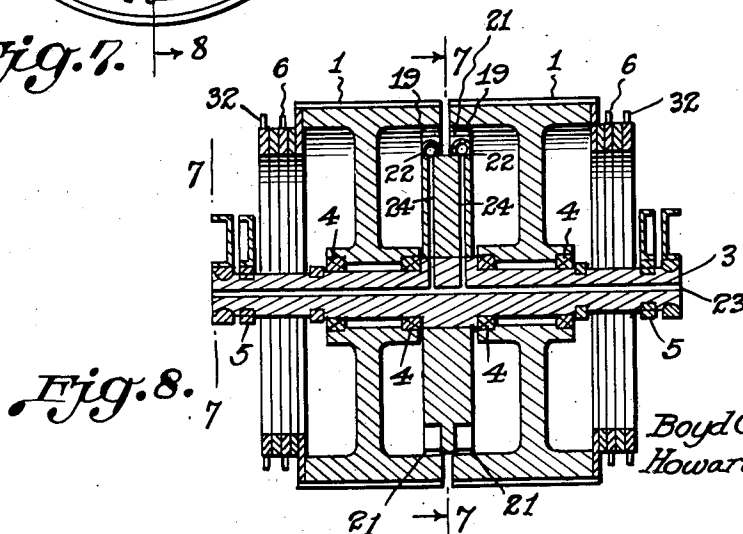


Fig. 8.

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UNITED STATES PATENT OFFICE

2,164,845

POWER ROLLER FOR COMPACTING MATERIALS USED IN VARIOUS TYPES OF SURFACING

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Application August 28, 1936, Serial No. 98,389

7 Claims. (Cl. 94—50)

The object of our invention is to provide an improved power roller for compacting materials used in various types of surfacing; to operate under its own power to be movable under its own power at a rapid rate of speed; to provide a roller which will give the results of a solid roller but at the same time will permit differentiating; and to provide the novel combination and arrangement of parts disclosed in the accompanying drawings and hereinafter described and claimed.

We attain these and other objects of our invention by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a top plan view of the invention;
Fig. 2 is a side elevation of the machine in position for operating as a roller, with auxiliary wheels supported clear of ground;

Fig. 3 is a side elevation of the machine in position for moving at a rapid rate of speed, with rollers 1 supported clear of ground;

Fig. 4 is a rear elevation of the invention when in the position shown in Fig. 2;

Fig. 5 is an alternate or modified form of drive;

Fig. 6 is a side elevation of the form of drive shown in Fig. 5;

Fig. 7 is a section on line 7—7 of Fig. 8, showing details of the construction of the rollers; and

Fig. 8 is a transverse section through the rollers on line 8—8 of Fig. 7.

Like numerals designate like parts in each of the several views.

Referring to the accompanying drawings, we provide the twin rollers 1, mounted on a suitable main or front frame 2. Rollers 1 rotate around hollow shaft 3 on tapered roller bearings 4. Shaft 3 is mounted rigidly to main frame 2 by means of keyed boxings 5. Rollers 1 are provided with sprockets 6, rigidly attached, which are driven by the chains 7, which in turn are driven by the sprockets 8, which are keyed to differentiate axles 9.

The motive power is supplied to the differential axles 9 by the engine 10 through the clutch 11, transmission 12, and differential 13, mounted on the inside frame 14. The differential axles 9 are equipped with hand brake assemblies 15.

The main frame 2 is supported at its front end either by one or two preferably flat tread pneumatic rubber-tired wheels 16, which are connected thereto by a fork 17. The front wheels 16 are steered by a worm-driven steering device 18. The worm-driven steering assembly is manually controlled by a suitable conventional commercial steering wheel and column which may be conveniently located with reference to other control,

as shown in Figs. 1 and 2, the worm being affixed to the post of the fork, as shown.

If two wheels are preferred, any suitable commercially built front axle assembly may be substituted for the fork 17, but in that case the tread of the front wheels should not exceed that of the roller.

The twin rollers 1 rotate independent of each other to gain the advantage of differentiation, but are spaced close enough together to give the effect of a solid roller. Each roller 1 is provided with an internal expansion brake shoe 19 anchored to brake anchor 20 rigidly fixed to hollow shaft 3. The braking effect is accomplished by the brake shoe 19 being forced against the brake drum 21 which is attached to the inside of the roller 1.

We provide a hydraulic cylinder and piston 22 to operate the brake shoe 19 to engage the brake drum 21, as shown in Fig. 7 of the drawings. The hydraulic cylinder 22 is supplied with liquid from a master cylinder through the tubes 44 leading to the channel 23 in said hollow shaft 3, and in turn through channel 23 to channel 24 in brake anchor 20 as shown in Figs. 1 and 8. The brake is operated by the foot pedal 45, which is conveniently located to the operator.

The machine is provided at its rear end with a rear frame 27 to which are rigidly fixed the rear boxings 28 and the front boxings 28a. The rear frames 27 and rear boxings 28 are capable of a pivotal movement on the axle 29 which carries the rear auxiliary wheels 25. Front boxings 28a (Figs. 2 and 3) loosely engage the hollow shaft 3 to permit a slight rotation around that shaft and an up-and-down swinging movement of that shaft and of the rear portion of the front main frame, the front end of which with forks 17 pivots on the axle 16a of the front wheels when the rear end of the main frame 2 and the rollers carried by shaft 3 are raised from the ground as shown in Fig. 3. Shaft 3 is mounted rigidly to main frame 2. Boxings 28a prevent movements sideways of the hollow shaft 3 while permitting of the up-and-down movement of that shaft with the rollers and the adjacent ends of the main frame and rear frame as described.

We provide sprockets 30 rigidly attached to and operating with the rubber tired wheels 25 whereby the wheels turn with the sprockets. The sprockets 30 are driven by chains 31, which in turn are driven by sprockets 32, which latter sprockets are rigidly attached to rollers 1. The wheels 25 are equipped with a suitable conventional internal expansion hydraulic brake assembly operated by a suitable foot pedal conveniently located to the

operator. The wheels 25 rotate around the rear axle 29 on tapered roller bearings. The rear axle 29 is rigidly mounted to frame 27 by the boxings 28, as shown in Figs. 2 and 3.

5 We provide double-acting hydraulic jacks 28 having a cylinder, a piston and a piston rod, the lower end of the piston rod being pivotally connected at 41 to the swingable rear frame 27 and the upper end of the cylinder being pivotally connected at 42 to the upwardly slanting frame member 2a. Frame members 2a are rigidly affixed to the horizontal front frame 2. Frame struts 33 which extend between frame members 2a and 27 function to relieve the tension in hydraulic jacks 10 28. Frame struts 33 are rigidly affixed to frame members 2a and adjustably affixed to frame member 27 by means of bolts or tapered and keyed pins 33a. It will be noted that the members 33 are provided with a plurality of spaced apertures 15 whereby they may be secured in an adjustable position by means of the bolts or pins 33a.

The hydraulic jacks 28 are supplied with liquid from a suitable master cylinder (not shown) and operated by a suitable pump. We provide cross 25 braces 34, as shown in Fig. 1, which function to make the frame 27 more rigid.

In operating this machine as a roller the wheels 25 are jacked upwardly a sufficient distance to fully clear the ground and supported by frame 30 struts 33, thus permitting rollers 1 to come in contact with the surface to be rolled.

Movability of this machine under its own power at a rapid rate of speed is obtained by jacking frame member 2a upwardly a sufficient distance to fully clear rollers 1 of the ground and supporting frame members 2a by frame struts 33, thus permitting rubber tired wheels 25 to support the rear end of the machine.

Figs. 5 and 6 represent an optional attachment 40 which may be used in case it is desired to operate roller and pneumatic rubber tired wheels independent of each other.

The structure shown in Figs. 5 and 6 is an assembly which is interposed between shaft 9 45 and the large rollers 1 and is hung between frames 2 and 14. The sprockets 8 are removed and the new assembly shown in Figs. 5 and 6 is substituted. The spline hub 35 is keyed to the differential axle 9 and replaces one of the sprockets 50 8 in Fig. 2. The sliding spline gear 36 is driven by spline hub 35 and may be shifted back and forth on that hub by the fork 27a, which engages the collar 37, that collar being integral with or affixed to the gear 36. Gear 36 is shifted 55 back and forth to engage either the sprocket 38 or the sprocket 40. Sprockets 38 and 40 both idle on shaft 39. Sprocket 38 is affixed to or integral with gear 38a which drives chain 31. Sprocket 40 is integral with or affixed to gear 40a which drives chain 7. When gear 36 meshes 60 with and drives sprocket 38, as shown in Fig. 5, the drive goes through gear 38a and chain 31 to sprocket 38 so as to drive the wheels 25.

When gear 36 is in position to mesh with and 65 drive sprocket 40 the drive goes through sprocket 40 and chain 7 to sprocket 6 to drive the big rollers 1. It will be noted from Fig. 5 that sprocket 38, with its gear 38a, is on a different hub from sprocket 40 with its gear 40a, and that the 70 sprockets with their respective gears operate independently of each other.

What we claim is:

1. In a power roller of the type described, the combination of a front frame, a front wheel, 75 means for steering same, twin rollers, an engine

independently controlled means operatively connecting said rollers with and driving them from the engine for easily controlled operation under its own power, a stationary shaft on which said rollers are revolvably mounted, a rear frame pivotally connected to said shaft and swingable 5 downwardly to an angle relative to the front frame, an axle carried by said rear frame, wheels rotatably mounted on said axle, sprockets attached to and rotatable with said wheels, and 10 power means for raising and lowering the pivotal rear frame to bring the wheels into and out of contact with the ground and thereby to correspondingly raise or lower the rollers.

2. In a power roller of the type described, the 15 combination of a horizontal front frame, a front rollable supporting and steering means, twin rollers, an engine independently controlled, means operatively connecting said rollers with and driving them from the engine for easily controlled 20 operation under its own power, a stationary shaft on which said rollers are revolvably mounted, a rear frame pivotally connected to said shaft and swingable downwardly to an angle relative to the front frame, an axle carried by said rear 25 frame, wheels rotatably mounted on said axle, sprockets attached to and rotatable with said wheels, and power means for raising and lowering the pivotal rear frame to bring the wheels into and out of contact with the ground and 30 thereby to correspondingly raise or lower the rollers.

3. In combination with the mechanism defined in claim 1, the front frame having rear 35 upwardly slanting frame members, struts affixed at their upper ends to said slanting members, and means for adjustably bolting the lower ends of said struts in either of a plurality of positions to the rear frame, for the purposes described.

4. In combination with the mechanism defined 40 in claim 2, the front frame having rear upwardly slanting frame members, struts affixed at their upper ends to said slanting members, and means for adjustably bolting the lower ends of said struts in either of a plurality of positions to the 45 rear frame, for the purposes described.

5. In a power roller operated and transported under its own power, the combination of a substantially horizontal front frame, front rollable 50 and supporting steering means, a roller, an engine, means operatively connecting said roller with and driving it from the engine, a hollow shaft on which said roller is mounted, a rear frame pivotally connected to said shaft and swingable 55 downwardly to an angle relative to the front frame, an axle carried by said rear frame, wheels mounted on said axle, sprockets attached to and rotatable with said wheels, hydraulic power means for raising and lowering the pivotal rear frame to bend the wheels in and out of contact 60 with the ground and thereby to correspondingly raise or lower the rollers.

6. In combination with the apparatus defined in claim 5, the front frame having rear upwardly 65 slanting frame members, struts affixed at their upper ends to said slanting members, and means for adjustably bolting the lower ends of said struts in either of a plurality of positions to the rear frame, for the purposes described.

7. In a power roller capable of operation and transportation under its own power, the combination of a front frame, a front wheel, means 70 for steering same, independently controlled twin rollers, an engine, means operatively connecting 75

each of said rollers with and driving them from the engine, a stationary shaft on which said rollers are revolubly mounted, a rear frame pivotally connected to said shaft and swingable
5 downwardly to an obtuse angle relative to the front frame, an axle carried by said rear frame, wheels rotatably mounted on said axle, the afore-said frame being of such length and the wheels so spaced as to equally distribute the weight and
10 driving power and braking power to each of the two rollers and to each of the two auxiliary

wheels, sprockets attached to and rotatable with said wheels, power means for raising and lowering the pivotal rear frame to bring the wheels into and out of contact with the ground and thereby to correspondingly raise or lower the
5 rollers, and to provide a machine capable of operation on an inclined surface and capable of easy steering.

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