June 23, 1942. W. B. BOYD ET AL 2,287,723

COMPACTOR

Filed Feb. 20, 1940 2 Sheets-Sheet 1

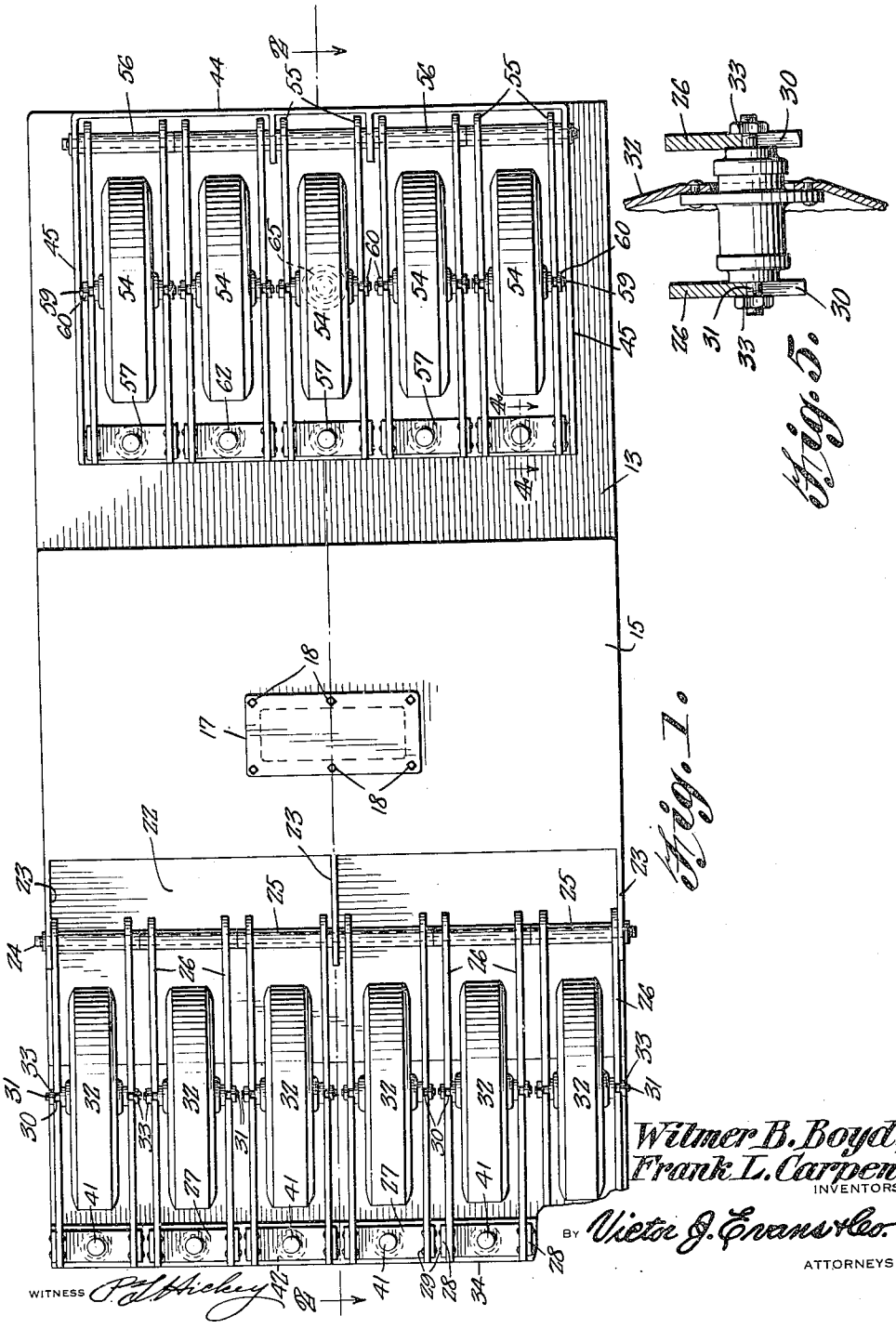


Fig. 1.

Fig. 5.

Wilmer B. Boyd,
Frank L. Carpenter,
INVENTORS

By Victor J. Evans & Co.
ATTORNEYS

WITNESS P. S. Hickey

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COMPACTOR

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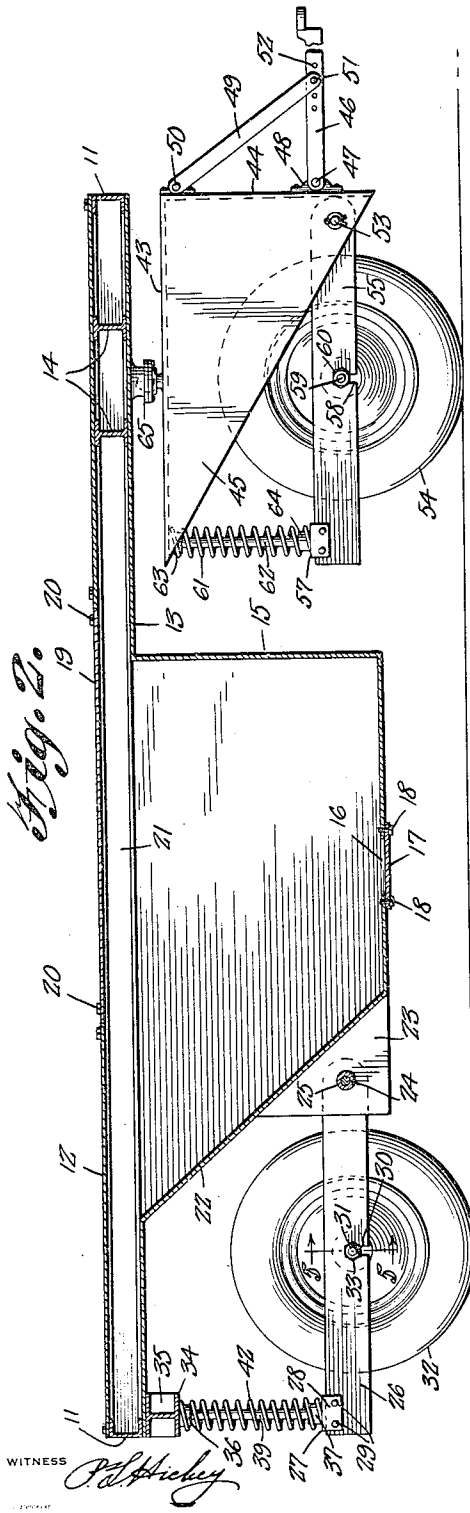


Fig. 2.

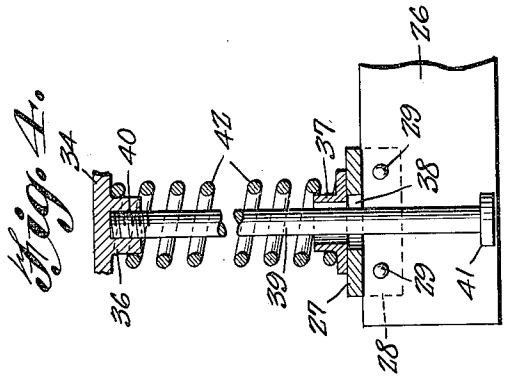


Fig. 4.

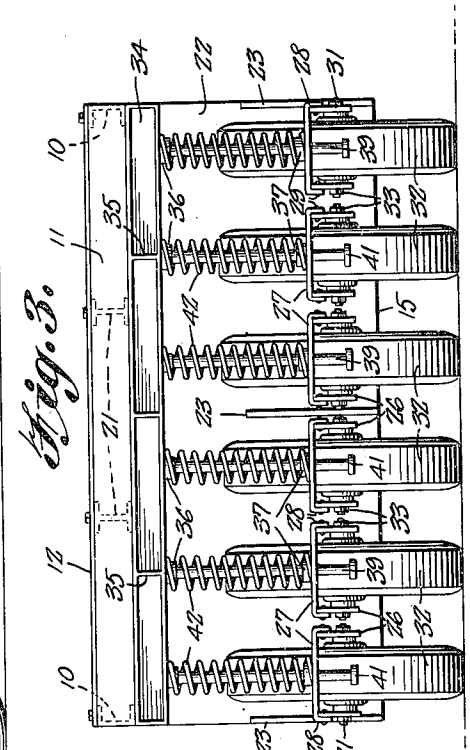


Fig. 3.

WITNESS P. L. Hickey

Wilmer B. Boyd,
Frank L. Carpenter,
INVENTORS

BY Victor J. Evans & Co.
ATTORNEYS

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COMPACTER

Wilmer B. Boyd and Frank L. Carpenter,
Lincoln, Nebr.

Application February 20, 1940, Serial No. 319,959

2 Claims. (Cl. 94—50)

This invention relates to a compacter for use in the compaction of soil stabilized surfaces, clay stabilized surfaces, soil cement stabilized surfaces, earth fills and earth embankments.

In the compaction of cement and clay stabilized surfaces and in the compaction of earth fills and embankments certain sections of the material will compact or set more rapidly than others. The only method of securing compaction of the softer sections is by rolling or kneading the material to bring the moisture to the surface where it passes off by evaporation. When a conventional compacter having roller wheels on a rigid axle is used, the rolling action never reaches the portion of the roadway containing the soft material because of the bridging action of the wheels on either side of the soft section. When the material is being spread and later when the surface is being shaped, a conventional compacter will raise up on windrows of excess material that are in the roadway and throw all the weight of the roller on one or two wheels causing abnormal and damaging weight on the one or two wheels carrying the load. In use a conventional compacter jumps and chatters when rolling at high speed or the roller passes over some object or excess material in the roadway.

With the above in mind the present invention provides an individual spring action for each wheel to permit any wheel reaching the portion of the roadway containing the soft material since the independent spring action of the wheels permits one or more of the wheels being forced down against the soft section to cause the soft section to set up or harden faster, without disturbing the remaining wheels, the independent spring action further providing complete and practical operation in the rolling of shoulders and edges of stabilized surfaces or roadways since it is possible to roll any or all portions of the shoulder and edge by letting one or more of the wheels roll down on the edge, while the other wheels are kept on the roadway, a further advantage of the individual spring action of each wheel being to maintain proper and equal load distribution on each individual wheel so that the roller will not jump or chatter when rolling at high speed or when the roller passes over some object or excess material in the roadway.

A further object of the invention is to provide individual axle assemblies of the wheels to promote quick and easy removal of any wheel by loosening only two nuts, one on either side of the wheel yoke.

A further object is to provide a device of this character which will be formed of a few strong simple and durable parts, which will be inexpensive to manufacture, and which will not easily get out of order.

With the above and other objects in view the invention consists of certain novel details of construction and combinations of parts hereinafter fully described and claimed, it being understood that various modifications may be resorted to within the scope of the appended claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings forming a part of this specification:

Figure 1 is a bottom plan view of a compacter constructed in accordance with the invention.

Figure 2 is a longitudinal sectional view of the compacter taken on the line 2—2 of Figure 1 looking in the direction of the arrows.

Figure 3 is a rear elevation of the compacter.

Figure 4 is a longitudinal sectional view of the independent spring action of each wheel.

Figure 5 is a detail cross sectional view taken on the line 5—5 of Figure 2 showing the slots and nuts detachably mounting each wheel.

Referring now to the drawings in which like characters of reference designate similar parts in the various views, the compacter comprises a frame including longitudinal bars 10 and end bars 11, these bars being formed of channel metal, top and bottom plates 12 and 13 secured to the bars, and transversely disposed I-beams 14 connecting the longitudinal bars near the front of the frame to provide a firm support for the ball and socket joint of the dirigible front wheeled member of the compacter.

A ballast box 15 is supported by the frame substantially midway between the ends thereof and is supported in a low position to prevent swaying of the box at higher speeds. The box is provided in the bottom with an opening 16 which is closed by a cover 17, bolted as shown at 18, or otherwise secured to the box. Ballast may be dumped from the box through the opening 16. The top plate 12 has a removable central section 19 which is bolted in place as shown at 20, which when removed, permits filling the box 15 with ballast. As shown in Figure 3 for reinforcing the frame longitudinally to withstand the weight of heavy ballast, longitudinal I-beams 21 are dispcsed in spaced relation to each other and to the longitudinal bars 10 of the frame.

The rear wall 22 of the ballast box is inclined

downwardly and forwardly. Three triangular bracket plates 23 project rearwardly from the rear wall 22, two of these plates being disposed at the ends of the wall and one of these plates being disposed at the center of the wall, as best shown in Figure 3. A pivot shaft 24 is carried by the bracket plates 23 and extends transversely of the lower end of the ballast box to pivotally mount the individual forks of respective compacting wheels as will now be described.

Each fork comprises a sleeve 25 which is loosely mounted on the pivot shaft 24. A pair of bars 26 are fixed at the front ends to the sleeve and extend rearwardly to a point underneath the rear bar 11 of the frame. The bars are connected together at their rear ends by a saddle plate 27 of inverted U-shape, the side flanges 28 of the saddle plate extending downwardly along the outer faces of the bars 26 and being bolted thereto, as shown at 29.

As best shown in Figure 5, a pair of transversely aligned slots 30 are formed in the bottom 26 and open through the bottom of the bars. These slots receive the spindle 31 of a conventional automobile wheel 32 or other wheel. A pair of nuts 33 are threaded onto the ends of the spindle and abut the outer faces of the bars 26 to secure the wheel to the bars. When the nuts are loosened, the wheel may be dropped out of the supporting fork through the slots 30.

Each wheel supporting fork is yieldably suspended at the rear end from the frame and for this purpose an I-beam 34, provided with reinforcing webs 35, as shown in Figure 3, is secured to the rear ends of the longitudinal bars 10 and rear ends of the reinforcing I-beams 21. The I-beam 34 is provided on the bottom face with interiorly threaded bosses 36, one above each saddle plate 27, and the respective saddle plate is provided with a tubular boss 37, best shown in Figure 4. The saddle plate is provided with an opening 38 which registers with the boss.

The independent spring suspension for each wheel comprises a guide rod 39 provided at one end with screw threads 40 to permit the rod being threaded into the upper boss 36 of the respective wheel. The rod is of sufficient length to extend loosely through the lower tubular boss 37 and opening 38 and at the bottom is provided with a stop collar 41 which is adapted to engage the saddle plate 27 and limit downward movement of the wheel under urge of a helical spring 42 which is sleeved upon the rod 39 and seated on the superposed bosses 36 and 37 when the wheel drops into soft material.

The front end of the frame of the compacter is supported by dirigible front wheels, each having its respective pivoted yoke or fork and spring suspension. The front wheel assembly comprises a housing including a top wall 43, a vertical front wall 44 and triangular side walls 45. A draft bar 46 is pivotally secured at the lower end to the front wall through the medium of a pivot pin 47 engaged in a bearing 48. A brace bar 49 is pivotally secured at the upper end to the top of the front wheel by a pivot pin 50 and is adjustably secured to the draft bar by a pin 51 which is interchangeably received in openings 52 formed in the draft bar to accommodate the draft bar to any make of tractor.

For mounting the front wheels on the housing a pivot shaft 53 is engaged through the triangular side walls 45 at the bottom of the front ends, and extends parallel with the front wall 44. Each individual wheel 54, likewise of the automobile type, or any other type, is carried by a respective fork or yoke comprising side bars 55, best shown in Figure 1, which are secured at the front ends to a respective sleeve 56 which is loosely mounted on the pivot shaft 53. The rear ends of the bars 55 are connected by a saddle plate 57. The bars are provided centrally with slots 58 which open through the bottom edges of the bars and receive the spindle 59 of the wheel 54. Nuts 60 are threaded onto the ends of the spindle and abut the bars 55 to removably secure the wheel to the yoke. The spring suspension of each wheel is similar to the spring suspension of each rear wheel, above described, and comprises a helical spring 61 which is sleeved upon a guide rod 62. The guide rod is threaded at the upper end into a boss 63 which depends from the top plate 43 and is slantably engaged through a tubular guide boss 64 which is carried by the saddle plate 27. Thus each wheel may yield upwardly and downwardly independently of the other wheels to compact soft material.

A ball and socket joint 65 has one member thereof secured to the bottom plate 13 between the I-beams 14 and has the other member thereof secured to the top plate 12 of the housing at about the center thereof. This ball and socket joint permits the front wheel assembly being easily swung underneath the front end of the frame to make sharp turns when desired.

In operation the compacter is pulled by a tractor, truck, or other suitable means of traction, at any desired speed. During progress of the compacter each of the front wheels and each of the rear wheels will yield independently of the other front wheels and other rear wheels, upwardly and downwardly, to compact soft sections of the surface being treated.

From the above description it is thought that the construction and operation of the invention will be fully understood without further explanation.

What is claimed is:

1. In a compacter the combination with a frame, and a ballast box suspended intermediate the ends of the frame, of a rear compacter wheel assembly comprising bracket members projecting rearwardly from the ballast box, a pivot shaft carried by the bracket members extending transversely of and below the frame, a plurality of forks pivotally secured to the shaft and extending rearwardly to a point underneath the rear end of the frame, a saddle plate on top of the rear end of each fork, a compacter wheel journalled for rotation in each fork between the saddle plate and the pivot shaft, there being an elongated opening in each saddle plate, a respective rod for each fork rigidly secured at the upper end to the frame and slidably projecting through the elongated opening in the saddle plate of the fork, a helical compression spring sleeved on each rod between the frame and saddle plate, and a stop collar on each rod engageable with the underneath face of the saddle plate to limit downward movement of the fork and respective compacter wheel under action of said spring when the compacter wheel encounters a soft section of a roadbed.

2. In a compacter, the combination with a weighted frame, of a front compacter wheel assembly comprising a housing underneath the front end of the frame including top, front and side walls, a draft means secured to the front

wall, a universal joint connecting the top wall to the front end of the frame, a pivot shaft carried by the side walls extending transversely of and below the frame, a plurality of forks pivotally secured to the shaft and extending rearwardly to a point underneath the rear end of the top wall, a saddle plate on top of the rear end of each fork, a compacter wheel journalled for rotation in each fork between the saddle plate and the pivot shaft, there being an elongated opening in each saddle plate, a respective rod for each fork rigidly secured at the upper end to the top wall and slidable vertically through the elongated opening in the saddle plate of the fork, a helical compression spring sleeved on each rod between the top wall and the saddle plate, and a stop collar on each rod engageable with the underneath face of the saddle plate to limit downward movement of the fork and respective compacter wheel under action of the respective spring when the compacter wheel encounters a soft section of the roadbed.

WILMER B. BOYD.
FRANK L. CARPENTER.