Aug. 9, 1927. 1,638,294

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PAVING ROLLER AND STEERING MECHANISM

Filed Aug. 23, 1924 2 Sheets-Sheet 1

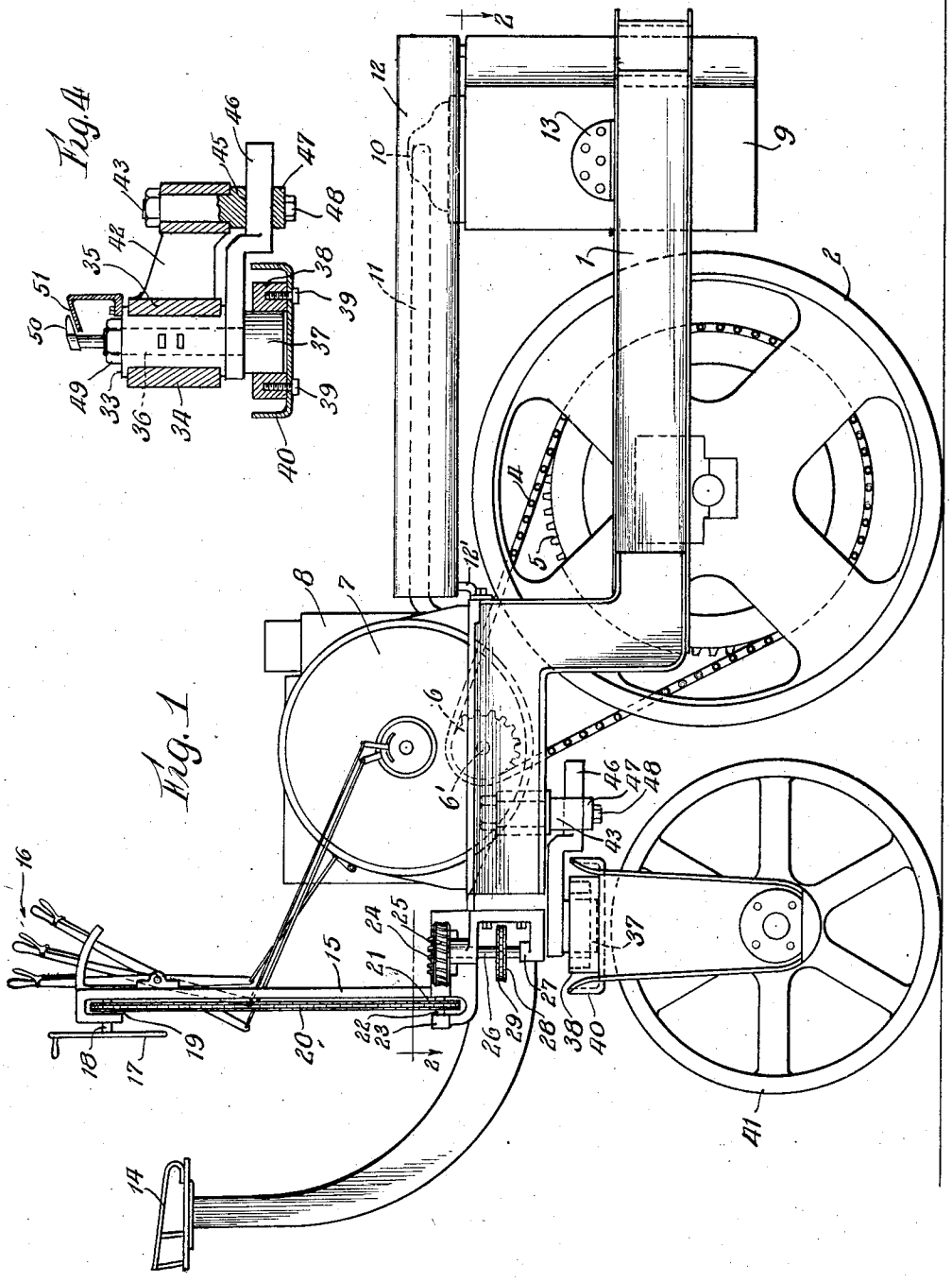


Fig. 1

Fig. 4

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Fig. 3

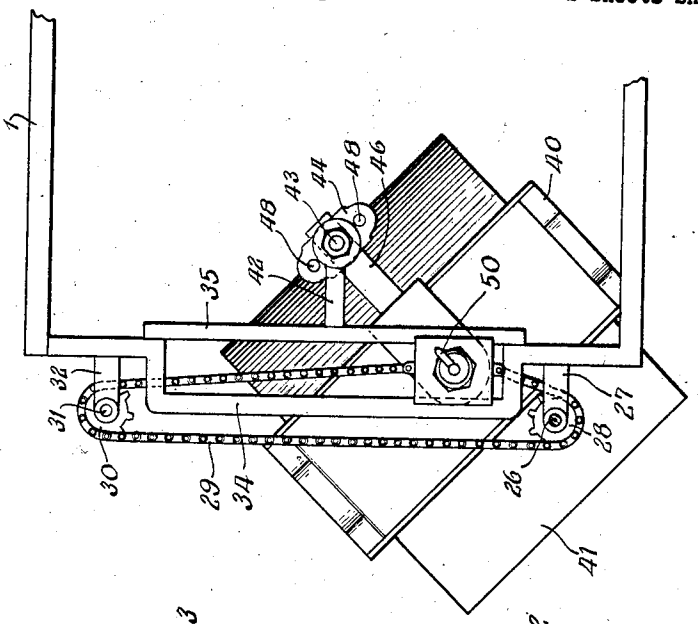
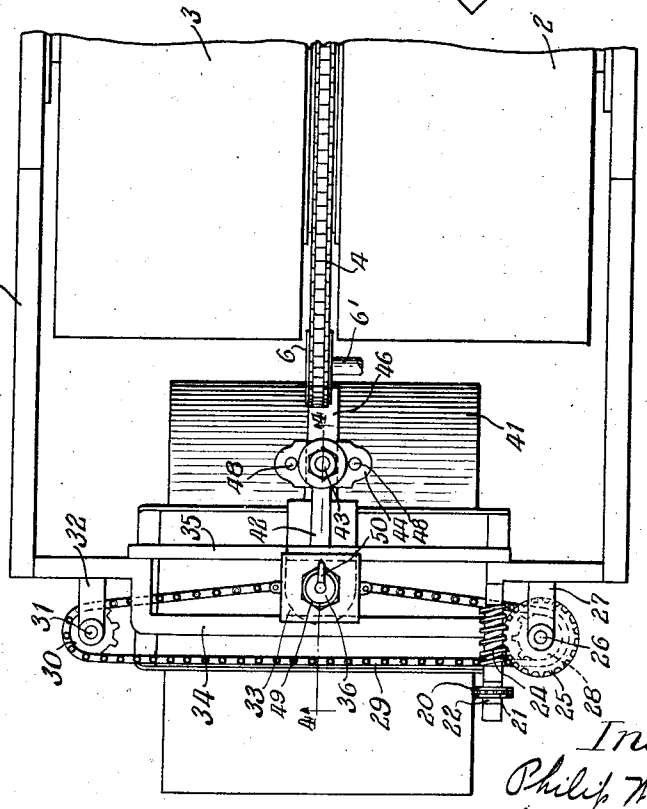


Fig. 2



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UNITED STATES PATENT OFFICE.

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PAVING ROLLER AND STEERING MECHANISM.

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This invention relates to a novel and improved paving roller and steering mechanism particularly adapted for use therewith although not necessarily limited to such use.

The principal object of my invention is to provide a paving roller having a short turning radius whereby it may be turned in a narrow space without having to back around as is customary with the rollers now in general use. This backing around necessitates repeated stopping and reversing and these operations result in forcing the soft pavement into small hills and valleys, thus offsetting the principal purpose desired to be achieved by a roller, namely, a smooth surface.

More specifically an object of my invention is to provide a roller which may be turned while running in one direction, for example, by a continuous forward movement.

A still further object is to provide a roller having means for indicating the radius upon which it is turning whereby the operator may properly set the steering mechanism.

A still further object is to provide a roller of simplified construction which may be operated by a direct drive from the engine.

A still further object is to provide a roller, the parts of which are compactly and effciently arranged to give the best distribution of weight.

In the accompanying drawings in which I have illustrated a selected embodiment of my invention,

Fig. 1 is a side elevation of a roller embodying my invention.

Fig. 2 is a fragmentary plan view on the line 2—2 of Fig. 1, parts being omitted for the purpose of clearness.

Fig. 3 is a view similar to Fig. 2 of a portion of the structure illustrated in Fig. 2 and showing the mechanism in a different position.

Fig. 4 is a section on the line 4—4 of Fig. 2.

Referring now to the drawings, the numeral 1 designates a frame of generally rectangular form and supported upon the front or driving rolls 2 and 3. These rolls are disposed in alignment, as is customary, and are spaced apart a sufficient distance to receive a roller chain 4 engaging sprocket 5, operatively connected to the rolls and also trained over the sprocket 6 on a shaft 6′ of the engine 7. This engine may be of any suitable type, but I have shown it herein as being of the rotary type and having a generator or boiler 8. As will be seen from an inspection of Fig. 1, the boiler and generator are mounted rearwardly of the rolls 2 and 3 and mounted on the frame 1 in front of these rolls is the water tank 9 which supplies water to the generator 8 through a suitable connection not shown. Above the water tank is mounted a condenser 10 connected to the engine 7 by suitable exhaust pipe 11. This exhaust pipe passes through the ballast tank 12 which is supported by a suitable bracket 12′ and by the water tank 9, the water tank 9 being in turn supported on the frame by a suitable bracket 13. This distribution of weight has been found to be very satisfactory, resulting in a roller which is well balanced.

Supported on the rear end of the frame 1 by any suitable means is a seat 14 and in front of the seat is a frame 15 which supports controls 16 for the engine 7. The frame 15 further carries a hand wheel 17 having a shaft 18 on which is mounted a sprocket 19 driving a chain 20 which in turn engages a sprocket 21 on a shaft 22 journaled in a suitable bracket 23 carried on the main frame 1. The shaft 22 is provided with a worm 24 engaging a worm gear 25 upon a shaft 26 journaled in a suitable bracket 27 and which carries a sprocket wheel 28 around which is trained a sprocket chain 29.

The chain 29 passes around a sprocket 30 adjacent the other side of the frame 1 and carried by a shaft 31 journaled in a suitable bracket 32. This chain 29 is the steering or guiding chain and it performs this function by movement of a king bolt block 33, slidably supported between the guide members 34 and 35 of the frame 1. This block 33 carries the king bolt 36 having a head 37 revolubly supported in a block 38 fastened by any suitable means 39 to the saddle 40. The saddle 40 carries the rear or steering roll 41.

Referring particularly to Fig. 4, the guide member 35 is provided with a suitable bracket 42 in which is swiveled a T-bolt 43 having a head 44 recessed at 45 to slidingly receive the king bolt tail end 46 retained in said recess by a suitable plate 47 secured to the bottom of the head 44 as by lag screws 48. The tail end 46 is rigidly secured to the king bolt 36 to turn therewith and such turning movement will, of course, result in ro-

tating the T-bolt 43. The king bolt is provided adjacent its upper end with a nut 49, or the like, to hold it in position in the king bolt block 33 and above the nut 49 the king bolt is reduced in diameter, as shown, and provided with a pointer 50 to co-operate with a suitable scale 51, for a purpose which will presently appear.

The operation of the steering apparatus will be apparent from an inspection of the drawings, particularly Figs. 2 and 3. When the roller is moving straight ahead the rear or guiding roll will be in the position shown in Fig. 2 wherein it is parallel wth the front or drive rolls 2 and 3. When it is desired to turn the roller the operator merely rotates the hand wheel 17 in the proper direction. This rotation will actuate the chain 29 through the train of gearing described above to move the king bolt block 33 in the guide formed by the members 34 and 35. Movement of the king bolt block will, of course, cause movement of the saddle 40 and the entire roll 41 transversely of the roller and at the same time, due to the engagement of the tail end 46 with the T-bolt 43, the king bolt and consequently the entire saddle and guiding roll will be rotated about the axis of said king bolt to some such position as shown in Fig. 3. During this movement the tail end 46 will slide in the recess in the T-bolt. The angle at which the rear or guiding roll is inclined to the roller is indicated by the pointer 50 and the scale 51 may be graduated to indicate the radius of the circle on which the roller is moving, or it may be graduated otherwise, as desired. The length of the various rolls is so proportioned that the steering roll will always run within the path of the driving rolls and will also cover the space between the two driving rolls, thereby insuring that the entire surface of the pavement is being rolled.

From the above it will be apparent that I have provided a roller which is extremely simple in construction and well balanced as to weight, and also one which will operate in a narrow space. A roller constructed and operated in the manner set forth above may make a complete turn within a street which is ten feet between curbs or, in other words, on a five foot radius, the path which it takes being in the form of a spiral and its movement always being a forward one. By employing an engine with a horizontal shaft and a chain drive operating between the driving rolls I have simplified the construction by the elimination of much of the driving mechanism usually employed with a roller. This is made possible by employing a compact engine having a horizontal shaft arranged transversely of the roller.

While I have shown my steering mechanism applied to a roller I do not desire to be limited to its use with a roller because I am aware that it may be employed with other types of equipment, such as a tractor or any other device employing rolls or wheels, and in the claims I shall use the word "roll" to include wheels and other traction devices.

I am aware that changes in the form, construction and arrangement of parts may be made without departing from the spirit and without sacrificing the advantages of the invention and I reserve the right to make all such changes as fairly falls within the scope of the following claims:—

I claim:—

1. In a device of the class described, a frame, a driving roll supporting said frame, a steering roll, and means to move said steering roll transversely of said frame.

2. In a device of the class described, a frame, a steering roll, and means to move said steering roll transversely of said frame and to rotate said roll about a vertical axis.

3. In a device of the class described, a frame, a guide on said frame, a block sliding in said guide, a steering roll pivotally secured to said block, and means for moving said block in said guide.

4. In a device of the class described, a frame, a guide in said frame, a block slidably mounted in said guide, a steering roll, a bolt pivotally mounted on said steering roll and rotatably mounted in said block, and means for sliding said block in said guide.

5. In a device of the class described, a frame, a block slidable in said frame, a bolt rotatably mounted in said block, a steering roll, means pivotally connecting said bolt with said roll, and a member rigidly connected with said bolt and slidably connected to a swivel on said frame.

6. In a device of the class described, a frame, a block slidable in said frame, a bolt rotatably mounted in said block, a steering roll, means pivotally connecting said bolt with said roll, a member rigidly connected with said bolt and slidably connected to a swivel on said frame, and means for sliding said block in said guide.

7. In a device of the class described, a frame, a block slidable in said frame, a bolt rotatably mounted in said block, a steering roll, means pivotally connecting said bolt with said roll, a member rigidly connected with said bolt and slidably connected to a swivel on said frame, means for sliding said block in said guide, and means for indicating the extent of rotation of said bolt.

8. In a device of the class described, a frame, a guide in said frame, a block slidably mounted in said guide, a bolt revolubly mounted in said block, a swivel on said frame, a member fast on said bolt and slidably mounted in said swivel whereby movement of said block in said guide will cause

rotation of said bolt and sliding of said member in said swivel.

9. In a device of the class described, a frame, a guide in said frame, a block slidably mounted in said guide, a bolt revolubly mounted in said block, a swivel on said frame, a member fast on said bolt and slidably mounted in said swivel whereby movement of said block in said guide will cause rotation of said bolt and sliding of said member in said swivel, and means for indicating the extent of rotation of said bolt.

10. In a device of the class described, a frame, a guide in said frame, a block slidable in said guide, a bolt rotatably mounted in said block, a scale mounted on said block above said guide, the upper portion of said bolt being provided with a pointer to cooperate with said scale, and means for moving said block in said guide and for rotating said bolt.

11. In a device of the class described, a steering roll, a saddle carried by said roll, a frame above said saddle, a guide in said frame, a block slidably mounted in said guide, a bolt rotatably mounted in said block and in said saddle, and means for moving said block in said guide and rotating said bolt in said block.

12. In a device of the class described, a steering roll, a saddle carried thereby, a frame above said saddle, a bolt pivotally supported on said saddle and pivotally and slidably supported on said frame, and means for imparting sliding and rotative movement to said bolt.

13. In a device of the class described, a steering roll, a saddle carried thereby, a frame above said saddle, a bolt pivotally supported on said saddle and pivotally and slidably supported on said frame, means for imparting sliding and rotative movement to said bolt, and means for indicating the extent of rotation of said bolt.

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