

UNITED STATES PATENT OFFICE.

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STEERING MECHANISM FOR TRACTION-ENGINES.

998,684.

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To all whom it may concern:

Be it known that I, EDWARD E. FEE, a citizen of the United States, residing at Rolla, in the county of Rolette and State of North Dakota, have invented certain new and useful Improvements in Steering Mechanism for Traction-Engines, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to steering mechanism for traction engines and has for its object to provide very novel means for automatically steering a traction engine across a field to direct its line of movement in accordance with the furrow.

A further object of the invention resides in the provision of novel means for mounting the steering mechanism whereby it may be adjusted so that any desired number of plows may be used upon the machine.

Still another object of my invention is to provide supporting means connected to the front axle of the engine, a transverse bar adjustable therein, a rod pivotally mounted upon said bar and ground engaging spherical members arranged upon opposite ends of said rod, and means for manually adjusting said members and the pivoted rod to direct the movement of the machine.

With the above and other objects in view, the invention consists of the novel features of construction, combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which

Figure 1 is a top plan view of a traction engine of conventional form, illustrating the manner of application of my improved steering mechanism; Fig. 2 is an enlarged side elevation of the steering mechanism; Fig. 3 is a section taken on the line 3-3 of Fig. 1; and Fig. 4 is a detail perspective view of the device removed from its support.

Referring in detail to the drawings 5 designates a traction engine of any approved or well known construction, and 6 and 7 the front and rear supporting axles respectively.

The purpose of the present invention is to provide suitable mechanism for steering the machine across the field, thereby eliminating the necessity of providing an additional operator for this purpose. In the present construction of such machines it is necessary that one man be provided who gives his whole attention to retaining the

traction plows in parallel relation to the furrow and to guide the machine in its movement across the field.

In carrying out my invention I provide the forwardly extending supporting rods or bars 8 which are pivotally mounted upon the opposite ends of the front wheel axle 6. One of these rods at its other end is rigidly secured to or integrally formed with the other of the rods and upon the same a sleeve 9 is formed. In this sleeve a transverse rod 10 is mounted and has limited rotation to compensate for unevenness in the ground surface or engagement of the device with obstructions. A collar 11 is secured to the rod 10 at each end of the sleeve 9, and one of said collars is provided with a notch 12 to receive a lug 13 formed on the end of the sleeve.

The steering mechanism proper consists of a rod 14 which is disposed below one end of the transverse rod 10 and is connected thereto by means of a tubular stem 15, the ends of which are extended through each of said rods. A bar 16 is rigidly secured upon the upper end of a shaft 17 which extends through the tubular stem 15 and through the rods 10 and 14. The lower end of this shaft has a crank 18 formed thereon in the end of which an eye 19 is swiveled. This eye receives an arm 20 which is rigidly fixed to a yoke 21 in which the ground engaging member 22 is rotatably mounted. The yokes 21 are pivotally mounted upon the ends of the rod 14, said yokes carrying short vertical spindles 23 which are centrally secured thereto and extend through the rod 14 in which they are rotatably mounted. A cross bar 24 is secured upon the square upper end of each of these spindles and the reverse ends of said cross bars are connected by means of the diagonally extending rods 25, the ends of which are angularly disposed and engaged in apertures in the ends of the cross bars, nuts 26 or other suitable retaining means being threaded upon the extremities of said rods. A coiled spring 27 is connected at its ends to the opposed ends of the arms 20 and normally acts to hold the members 22 in alinement with each other. To the opposite ends of the bar 16 the cables 27 are secured, said cables extending to the steering wheel of the engine upon the shaft of which they are adapted to be wound in the usual manner. In this manner the op-

erator may direct the engine upon reaching the end of the furrow so that the machine can be turned in the desired direction.

In the operation of my improved steering mechanism, the set screws which secure the transverse rod 10 in the collars 11 are loosened and said rod adjusted to position the ground engaging members 22 in the furrow. It will be obvious that this furrow will be disposed to a greater or less extent upon one side of the engine, in accordance with the number of traction plows which are used. It will be observed that the members 22 are of substantially spherical form. These members are of proper size in accordance with the depth and width of the furrow in which they move. By mounting the members 21 in the manner above specified, it will be obvious that if the forward member 22 strikes an obstruction, the rear member which retains its position in the furrow will direct the front member back into the furrow again after passing over the obstruction. The front spherical member 22 will not in the same manner in the event that the rear member should leave the furrow. These substantially spherical members may be either hollow or solid in cross sectional form and constructed of any preferred material. As they at all times retain their positions in the guide furrow, it will be obvious that they will follow the curvature of said furrow across the field being operated upon, and thereby guide the engine so that the traction plows move in a line parallel with said furrow. In this manner the field is quickly and properly plowed, without requiring the time and labor of an additional attendant to direct or steer the engine so that it will move in a proper line across the field. The principal feature of the invention resides in the provision of the members 22 having convex surfaces disposed in the furrow so that they will at all times be engaged with the base of said furrow. It is unnecessary, however, for these members to be perfectly spherical in form as the same may be flattened at opposite points for the attachment of the ends of the yokes 21 thereto.

From the foregoing it is thought that the construction and operation of my improved steering mechanism will be readily understood without necessitating any further description. The device is extremely efficient in practical use, may be manufactured at a comparatively low cost and eliminates considerable time and labor in the operation of the machine. No attention whatever is required in so far as the steering of the machine is concerned, until the end of the field is reached when the operator simply winds the cables 27 upon the steering shaft of the engine to swing the rod 14 through the medium of the shaft 17 to properly direct the spherical rollers so that the machine

may be turned in the desired direction. As soon as the operator releases the steering wheel, the spring 20' acts to return the spherical rollers to their proper normal positions in the furrow. Owing to the fact that but few elements are employed in the construction of the mechanism, it will be seen that the device is not liable to get out of order but on the contrary is extremely durable in practical use.

While I have shown and described the preferred construction and arrangement of the various parts, it will be understood that the device is susceptible of considerable modification without departing from the essential features or sacrificing any of the advantages thereof.

Having thus described the invention what is claimed is:—

1. A steering mechanism of the character described comprising a supporting rod, a second rod pivotally mounted on said supporting rod, spherical rollers rotatably and pivotally mounted upon each end of the latter rod, means yieldingly holding said rollers in alinement, and means for positioning said pivoted rod with relation to the supporting bar.

2. A steering mechanism of the character described comprising a supporting rod, a second rod pivotally mounted upon one end of said supporting rod, yokes pivotally mounted upon each end of the rod, spherical rollers rotatably mounted in said yokes, means connecting the pivots of said yokes to simultaneously position the rollers with relation to said rod, a spring yieldingly holding said rollers in alinement, and manually operable means for positioning said pivoted rod with relation to the supporting rod.

3. A mechanism of the character described comprising a support including a rod having limited rotation, a second rod arranged below the end of said rotatable rod and pivotally connected thereto for swinging movement in a horizontal plane, yokes having spindles thereon rotatably mounted in each end of the latter rod, cross bars secured upon the upper ends of said spindles, diagonally extending intersecting rods connected to the ends of said bars on opposite sides of said pivoted rod to connect the rollers for simultaneous movement, a spring yieldingly holding said rollers in alinement, and means for swinging said pivoted rod and angularly positioning the rollers with relation thereto.

4. A mechanism of the character described comprising a support consisting of bars pivotally mounted at one of their ends and connected together at their outer ends; a transverse rod mounted in the ends of said bars and having limited rotation, a rod mounted for swinging movement upon one

end of the transverse rod, a shaft extending through the pivot of said rod having a crank on its lower end, a yoke pivotally mounted upon each end of said rod, a substantially spherical roller rotatably mounted in each of said yokes, an arm secured to each of the yokes, a swiveled eye on the crank of said shaft to movably receive one of the arms, a spring connecting said arms to yieldingly hold the rollers in alinement, and manually operable means for simultaneously swinging said pivoted rod and positioning the rollers with relation thereto.

5. A steering mechanism of the character described comprising a support, a horizontally disposed rod pivotally mounted on said support, rollers pivotally mounted on each

end of said rod, and means connecting said rollers for simultaneous pivotal movement.

6. A steering mechanism of the character described comprising a support, a rod pivotally mounted on said support, a pair of rollers pivotally and rotatably mounted on said rod, means connecting said rollers and yieldingly holding the same against independent pivotal movement, and additional means for positioning said pivotally mounted rod with relation to the support.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

EDWARD E. FEE.

Witnesses:

J. D. BROWN,
ARTHUR T. SUMNER.