June 23, 1931. H. HORNSBY 1,811,394

INTERNALLY DRIVEN POWER ROLLER

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FIG. 1.

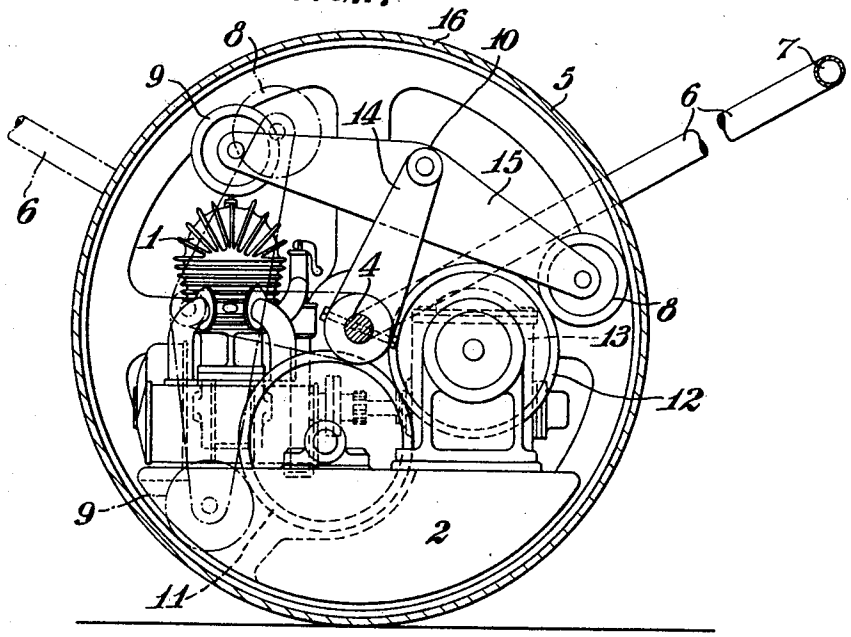
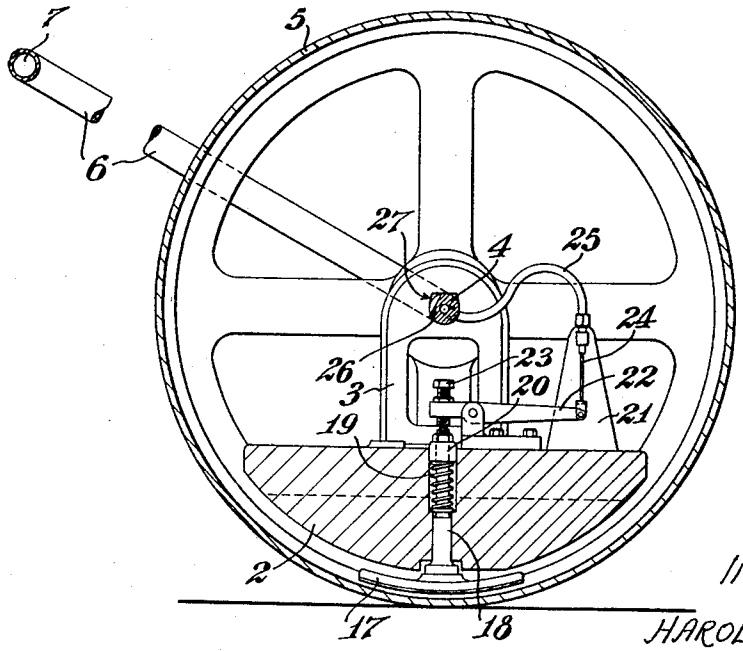


FIG. 4.



INVENTOR.
HAROLD HORNSBY
By D. Rowland Jr. Atty

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FIG. 2.

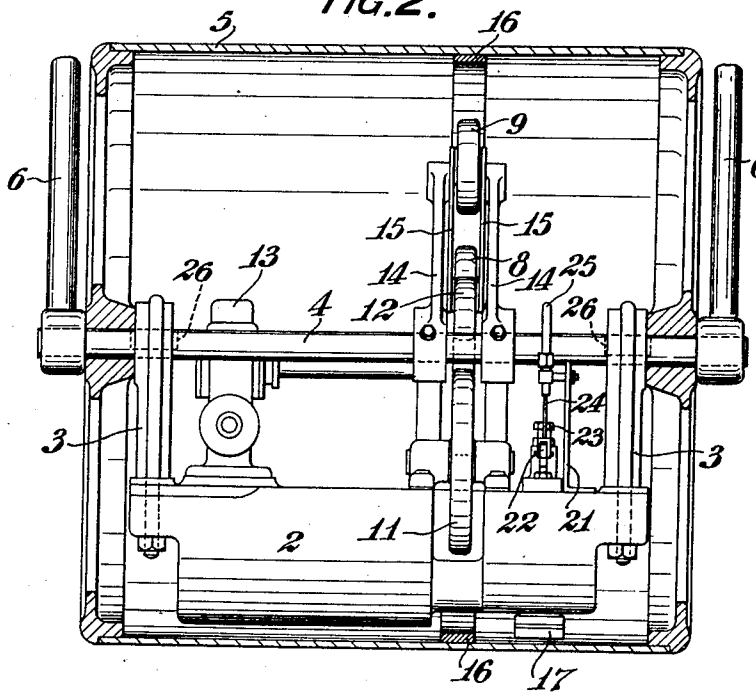
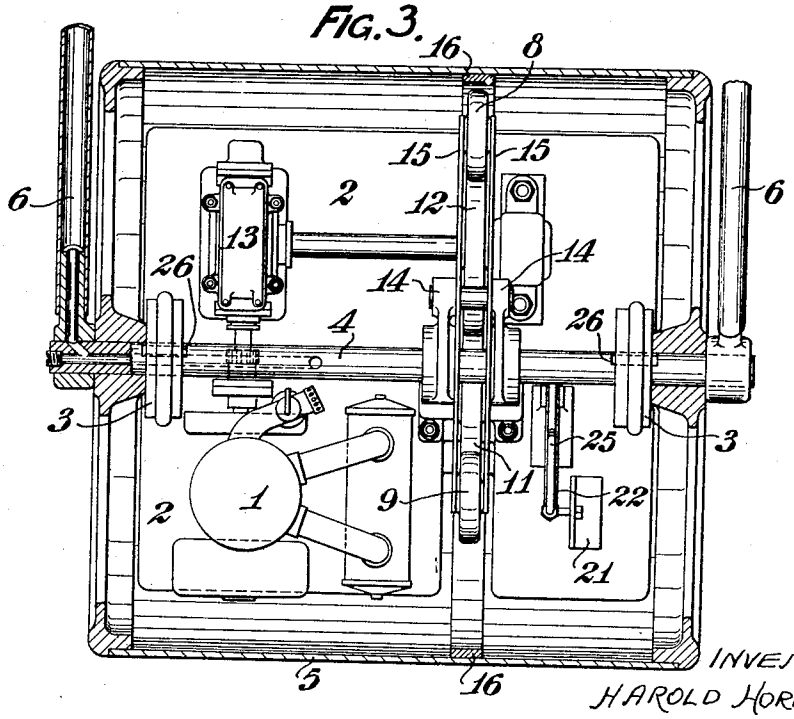


FIG. 3.



INVENTOR
HAROLD HORNSBY
By D. P. Wareham Ltd
Attys.

Patented June 23, 1931 1,811,394

UNITED STATES PATENT OFFICE

HAROLD HORNSBY, OF SCUNTHORPE, ENGLAND

INTERNALLY DRIVEN POWER ROLLER

Application filed March 8, 1930. Serial No. 434,422.

This invention relates to a power-driven roller suitable for rolling paths, lawns and any other surfaces, and concerns rollers of the kind wherein a power unit and driving gear are contained wholly within the roller and supported on a weighted body freely suspended from the roller axle, and wherein the steering handle and its frame are connected to the said internally disposed driving gear for causing the same to operate on the roller for driving the same selectively in opposite directions as and when required.

My invention is illustrated in the accompanying drawing, wherein:—

Figure 1 is a sectional plan view of the roller.

Figure 2 is a sectional front view thereof.

Figure 3 is a sectional plan view.

Figure 4 is a cross-section of the roller, illustrating a form of braking mechanism that may be employed.

Like numerals of reference indicate corresponding parts in the several figures.

In carrying out the invention and referring to the drawings, an internal combustion engine 1 is mounted on a heavily weighted body 2 freely suspended by arms 3 from the axle 4 of the roller 5, said axle 4 being fitted with opposed arms or levers 6 to which the handle 7 of the roller is connected.

The gearing, which is of the friction type, comprises a pair of rollers, respectively 8 and 9, each of which is rotatably mounted on a displaceable element 10 adapted to swing about the axis of shaft 4, and rigidly fixed to said shaft, said element 10 being hereinafter more particularly described, and a pair of greater diameter rollers 11 and 12 respectively, each rotatably mounted in bearings mounted on the weighted body 2 aforesaid.

Of the rollers 11 and 12, which are always in contact with one another, the roller 12 is driven from the engine 1 through suitable reduction gear indicated at 13.

The roller axle 4 at one end is provided with a longitudinal and central bore which communicates with the interior of one of the roller arms 6 for the passage of the carburetter control wires, fuel being drawn from a tank (not shown) inside the roller and mounted over the gear box.

For a forward rotation of the roller 5, the arms or levers 6 are depressed to turn the axle 4 and, by the resultant movement of the displaceable member 10, bring the roller 8 into close contact with the inner surface of the shell of the roller 5 and the roller 12, whilst the roller 9 remains clear of the inner surface of said shell.

That is to say, the drive from engine 1 to roller 5 is by way of reduction gear 13, roller 12, and roller 8, and the shell of the roller 5 aforesaid, the roller 11 running idle.

For a rotation of the roller 5 in reverse direction, the arms or levers 6 are swung over in the opposite direction and depressed to turn the roller axle 4 and displaceable member so as to bring the roller 9 into close contact with the inner surface of the shell of the roller 5, whilst the roller 8 remains clear of the inner surface of the shell aforesaid.

That is to say, the drive from engine 1 to roller 5 is by way of reduction gear 13, roller 11 and roller 9 and shell of the roller 5 aforesaid.

The roller 5 is provided with suitable openings in both ends thereof for access to engine and other parts, and the controls, not shown in the drawings, are conveniently mounted on the handle of the roller.

The displaceable member above referred to is constituted by a rigid arm 14 fixed to the axis 4 of the roller drum, and to the outer end of said arm 14 is pivotally connected at its centre a rocker 15 carrying at its respective ends the rollers 8 and 9 adapted to cooperate with the friction discs 11 and 12 in the manner hereinbefore set forth. Each of the elements 14 and 15 is, in practice, of double-cheek formation, i. e. composed of identical spaced-apart members. The formation of the T-shaped displaceable member formed by the members 14 and 15, and the consequent positions of the rollers 8 and 9 is such that when either one of said rollers is in driving position (e. g. the roller 8 as shown in Figure 1) the other roller (e. g. roller 9, Figure 1) is out of contact with the interior of the drum and also out of contact

with an internal tyre 16 formed on the interior of the drum. The pivotal supporting of the rocker 15 on the arm 14 allows of the said rocker adjusting itself to a most convenient position for driving when either roller 8 or 9 is in use.

The internal tyre 16 upstands from the main periphery of the drum 5 and since said tyre 16 forms the actual contacting surface for the rollers 8 and 9, the latter are kept out of contact with the inner surface of the drum shell itself so that any oil or greasy foreign matter which may become deposited on said drum shell will not be transferred to the rollers 8 and 9 and interfere with the friction gripping thereof.

I may, if desired, provide braking means for arresting movement of the roller and guarding against unintentional rolling thereof when out of use, which conveniently may be of the form illustrated in Figure 4. The said braking means comprises a brake shoe 17 shaped to conform to the contour of the drum and screwed or otherwise secured upon an operating rod 18 slidably mounted in the weighted body 2, which latter is, for a suitable length, enlarged in bore in order to accommodate a coil compression spring 19 which bears against a collar 20 screwed on to the upper end of the rod 18 and thereby urges the brake shoe to an innermost position. In a bracket 21 mounted upon the weighted body 2 there is pivotally mounted a lever 22, one end of which is furnished with a set-screw 23 adapted to bear upon the end of rod 18 and to be adjusted by rotational movement. To the other end of lever 22 is connected an actuating wire 24 which passes through a flexible tubular casing 25 into and along an axial bore in the shaft 4 from which it emerges outside the boundary of the drum 5, said wire then extending up one of the handle shafts to and being connected to any suitable hand-operated actuating device on the handle in the proximity of the operator's hands. It will be followed that a pull on said wire 24 imparted by the actuating device will result in the lever 22 being rocked and the rod 18 depressed, with resultant application of the brake shoe on to the inner surface of the drum.

The above-described mechanism therefore provides a manually-operated brake which can be applied whilst the angle of the handle 6 with respect to the ground remains constant, i. e. the most convenient position in use, but I also provide for actuation of the brake automatically by swinging movements of the handle 6 in such a manner that whilst the said handle remains held by the operator in the requisite inclined position during rolling operations, the brake remains released, whereas, when the handle is allowed to swing up to vertical position, the brake is automatically applied. This is effected by forming the axle 4, at each position where the suspension brackets 3 for the weight 2 are mounted thereon, with a flat 26 on its periphery, and by forming the bearing apertures 27 in the brackets 3 sufficiently large to allow rotational movement of the axle 4 therein and with a configuration which permits a flat at the top of the aperture. It will therefore be realized that when the axle is in a position where its flattened peripheral portions are uppermost and horizontal, thus corresponding to a vertical position of the handle 6, the flat portions of the apertures 27 will bear on said flat axle portion, and the weight 2 is then in a position in which the brake shoe 17 bears against the drum, the mass of the weight 2 and associated parts thereon being utilized to exert the braking effort. Swinging movement of the handle 6 in a direction on either side of a vertical upstanding position will cause the flats 26 on the axle to incline from the horizontal and the remaining circular portion of the axle periphery which then approaches the flat portions of the apertures 27 will cause the brackets 3 and consequently the weight 2 and brake shoe 17 to be lifted, with resultant release of the braking effort.

It will be followed also that owing to the aforesaid arrangement of flats on the axle and weight-suspension brackets there will be a tendency for the handle to swing upwardly automatically when out of use, due to the mass of the weighted body as affected by gravity. Thus, except when rolling operations are actually in progress, the roller will be automatically braked.

I claim:—

1. A power-driven roller for the purposes specified, having contained within the drum a suspended weighted body on which are mounted a power unit and rotatable friction discs constantly driven by said power unit, and having a displaceable element carrying rollers adapted to be brought into use selectively to frictionally transmit the drive from the rotary friction discs to the roller drum and rotate same in one or the other direction, and a guiding handle for the roller adapted to swing and to transmit its movements to the said displaceable element in order to effect driving of the roller in the direction required characterized in that the said displaceable member within the drum comprises a rigid arm secured to the drum axle and a rocker pivotally attached to said arm and having mounted on its respective ends a pair of rollers.

2. In a roller for the purposes specified, means for exerting a braking effort on the roller drum automatically by movement of the guiding handle to out-of-use position, and for automatically releasing such braking effort, by movement of said handle to a position for use.

3. In a power driven roller of the character described, a brake adapted to operate on the roller drum, means for applying said brake automatically by movement of the guiding handle to out-of-use position, and for automatically releasing said brake by movement of said handle to a position for use, and other means for applying said brake by manual control independently of movement of the guiding handle.

4. A power driven roller of the character described, characterized in that the axle which forms the axis of the swinging movement of the handle and moves therewith, is formed with a flat on its periphery, a weight and means for suspending the weight from said axle said means including a bearing aperture for said axle having a flat in its configuration adapted to co-act with the flat on the axle in such a manner as to raise the weight when the guiding handle is swung down to a position for use and lower said weight when said handle is swung up to out-of-use position, the said downward movement of the weight and mass thereof being utilized for applying a braking effort on the drum.

5. In a power driven roller of the character described, a weight, a brake shoe carried by the suspended weight and adapted to operate on the inner periphery of the drum, means for automatically raising the weight and brake shoe by movement of the guiding handle to position for use, with resultant release of the brake and for automatically lowering the weight and brake with resultant brake application when the guiding handle is moved to out-of-use position, and means operable from the guiding handle independently of swinging movements thereof for moving the brake shoe relative to the weight and pressing it into contact with the roller drum for braking purposes.

6. A power driven roller for the purposes specified comprising in combination a rotatable drum having contained therewithin a suspended weighted body on which are mounted a power unit and rotatable friction disc constantly driven by said power unit, a displaceable element also contained within said drum and adapted to swing about the axis of the drum and comprising an arm secured to the drum axle, a rocker pivotally attached to said arm and a pair of friction rollers mounted one on each end of said rocker adapted to be brought into use selectively to transmit the drive frictionally to the roller drum to rotate same in one or the other direction, a guiding handle for the roller adapted to swing about the drum axis and transmit its movements to the displaceable element in order to effect driving of the roller in the direction required, a brake shoe carried by the suspended weight and adapted to operate on the inner periphery of the drum, means for automatically raising the weight and brake shoe by movement of the guiding handle to position for use, with resultant release of the brake and for automatically lowering the weight and brake with resultant brake application when the guiding handle is moved to out-of-use position, and means operable from the guiding handle independently of swinging movements thereof for moving the brake shoe relative to the weight and pressing it into contact with the roller drum for braking purposes.

In testimony whereof I have affixed my signature hereto this 3rd day of February 1930.

HAROLD HORNSBY.