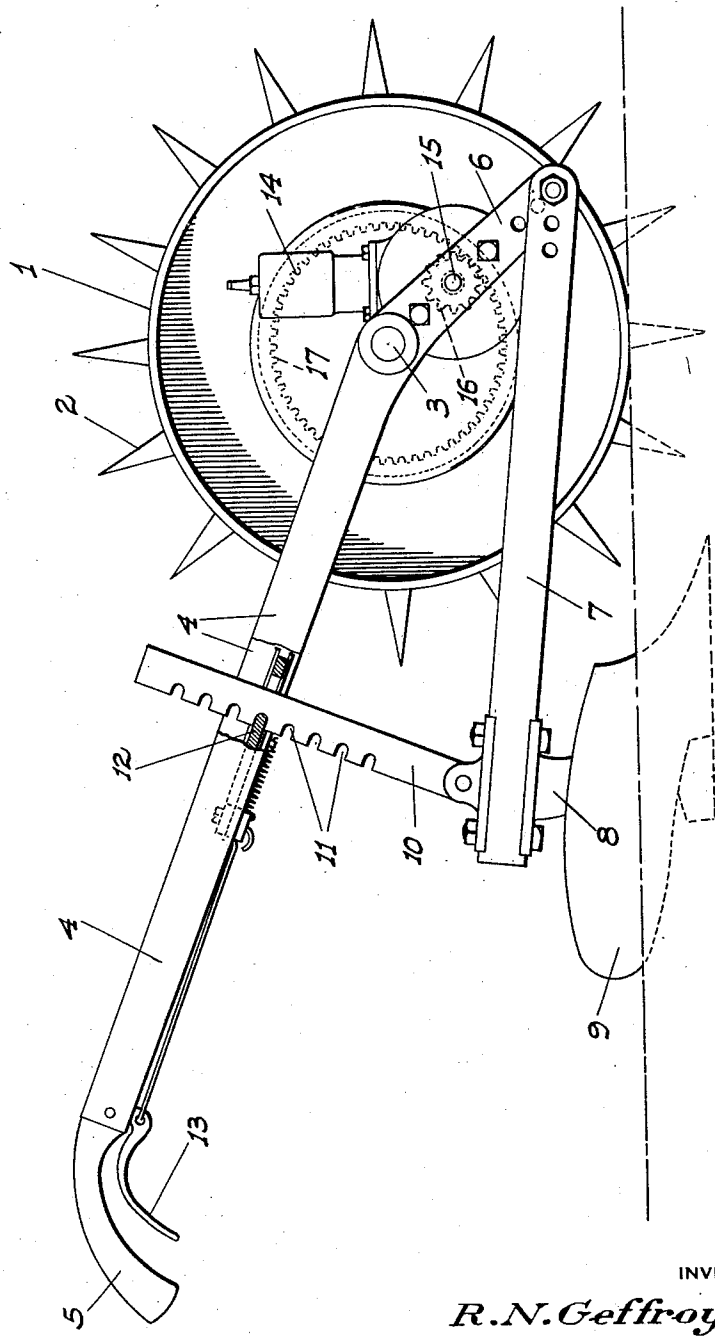
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EARTH WORKING IMPLEMENT

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EARTH WORKING IMPLEMENT

Application filed November 18, 1929. Serial No. 407,954.

This invention relates to earth working implements and particularly to power propelled implements of what is known as the hand tractor type, since it is in such implements that my invention is particularly of advantage.

In implements of this character it is difficult to overcome the ill effects of the power delivery to the driving wheel upon the desired free functioning or relatively frictionless movement of the plow or other tool, and a considerable loss of power is usually had.

The principal object of my invention is to eliminate the above objectionable features by connecting the power drive means to the driving wheel of the implement and by connecting the tool to the supporting parts so that with the forward movement of the implement, the power delivery is automatically balanced in direct proportion to the drag or resistance offered by the earth to the tool. As a result, the tool remains practically balanced, and the friction between the ground and the horizontal surface of the plow, and which consumes considerable power, is almost entirely eliminated.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

The figure on the drawing is a longitudinal elevation of my improved structure as applied to a wheel supported hand tractor plow.

Referring now more particularly to the characters of reference on the drawing, the numeral 1 denotes the driving and ground bearing wheel of the implement preferably having spikes 2 or the like projecting outwardly therefrom to provide the necessary traction with the ground. This wheel revolves on a horizontal shaft 3 fixed in side bars 4 which straddle the wheel and extend rearwardly of the same some distance to terminations in suitable handles 5.

These bars have downwardly angled arms 6 in front of the shaft, to the lower ends of which beams 7 are pivotally connected for adjustment both longitudinally and vertically; the distance from the point of connection to the ground governing the depth of working. Rearwardly of the wheels these beams support a standard 8 from which the tool depends, which in this case is shown as being an ordinary plowshare 9. An arm 10 projects upwardly from and is pivoted on the standard, said arm being provided with a row of notches 11 in its rear face adapted to be engaged by a slide-catch plate 12 mounted in connection with and between the bars 4. This plate is connected by suitable means to a release trigger 13 positioned convenient to one of the handles 5 so as to enable said plate to be selectively engaged with any notch in the arm at will.

Secured to one arm 6 is a power plant such as a gas engine 14 having a pinion 16 secured to the crankshaft 15 of the same which engages a gear 17 fixed in axial connection with the wheel 1 to rotate therewith. The wheel is freely open to one side so that the engine may be located inside the same. Though the engine is shown as being fixed on the arm 6 ahead of the shaft 3, since this gives more room for the engine, it could as well be secured to the bar 4 rearwardly of said shaft as far as the operation is concerned, as will be evident hereinafter.

In operation, with the forward rotation of the wheel and with the plow engaging the earth, there is a constant rearward pull on the arms 6, which of course exerts an upward-moving tendency on the handlebars. At the same time the driving of the wheel by the power plant mounted on the supporting arm (or on the handle-bar a corresponding distance from the shaft) has a tendency to rotate about the gear in the direction opposite to the rotation thereof. This will be the case regardless of which side of the shaft 3 the engine is disposed, whether an internal or external gear is employed, or whether a pair of gears of a compound gearing is used between the engine and wheel. Since the engine cannot actually rotate about the gear in this manner this pressure or force is ex-

erted in the form of a downward push on the bars 4, counteracting to a great extent the tendency of the same to lift, due to the drag of the plow or other tool. The greater the drag of the plow in the ground or the greater the resistance to the forward movement of the same, with an accompanying greater tendency to lift the handle bars, the more will be the tendency of the engine to rotate about the driving gear and the greater will be the pressure it exerts to hold said bars down. One pressure thus works against the other and a perfect power balance is thus maintained at all times and under practically all working conditions.

The position of the pinion-shaft on the arm, relative to the shaft, and the size of the driving gear, are so proportioned relative to the distance along the bars 4 from the shaft 3 to the point of connection of the arm 10 with the said bars, that a certain relatively light upward pressure is maintained at that point. This imparts a slight upward pull on the plow, relieving the horizontal bottom drag or frictional contact of the same with the ground, which friction consumes power to no useful end. The plow is therefore held substantially in a floating condition, and the power is all utilized in actually causing the plow to turn over the soil. Eliminating the downward pressure of the plow, as above described, also eliminates the tendency of the wheel to lift from the ground, which destroys its tractive effort.

By adjusting the beams 7 relative to the arms 4, or by adjusting the setting of the arm 10 relative to the handle-bars the depth of cut of the plow may be properly adjusted to varying soil conditions, without disturbing the power balance features. When it is desired to transport the implement without the plow operating, or to enable the plow blade to be cleaned of weeds or the like, it is only necessary to release the catch plate, depress the handles relative to the plow, and allow the catch to engage the arm 10 at a point lower down on the same. If then the handles are restored to their normal level the plow will be raised clear of the ground, as will be evident.

If, on account of an excessively heavy drag, the wheel should slip, traction may be restored by releasing the catch 12 and pressing down on the handle bars, which will force the driving wheel into firmer engagement with the ground.

While I have shown and described this power balance arrangement as being applied to a single wheel hand tractor, it may obviously be applied to any similar earth working implement whether the same is mounted on two or more wheels or is provided with endless tracks instead of wheels.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention what I claim as new and useful and desire to secure by Letters Patent is:

1. An earth working implement including a ground bearing wheel, a bar turnably mounted in connection therewith and projecting rearwardly therefrom, an arm depending from the bar at its forward end at an angle thereto and rigid therewith, a beam pivoted on said arm for both vertical and longitudinal adjustment and extending rearwardly therefrom, a tool depending from the rear end of the beam, an arm upstanding from the tool, and adjustable connection means between the last named arm and bar.

2. An earth working implement including a ground bearing wheel, a bar turnably mounted in connection therewith and projecting rearwardly therefrom, an arm depending from the bar at its forward end and rigid therewith, a beam pivoted on the arm and extending rearwardly therefrom, a tool depending from the rear end of the beam, an arm upstanding from the tool, and releasable catch means between the last named arm and the bar.

In testimony whereof I affix my signature.

RALPH N. GEFFROY.