Oct. 13, 1953 E. J. SMITH 2,655,047

STARTING DEVICE

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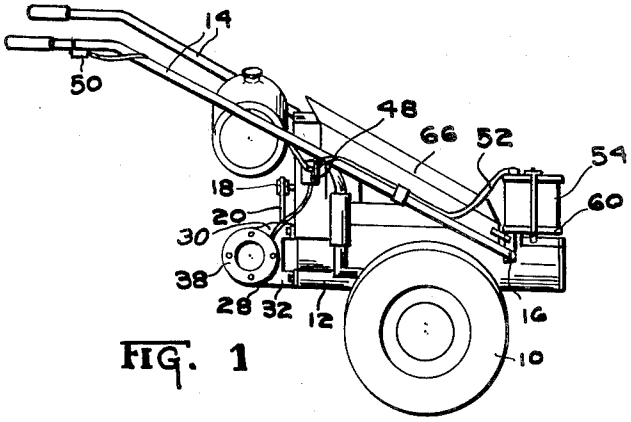


FIG. 1

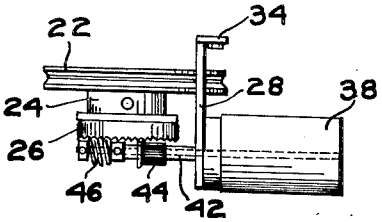


FIG. 3

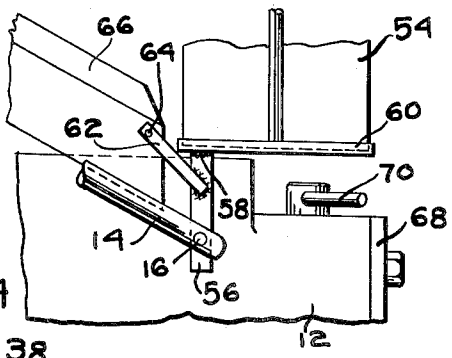


FIG. 4

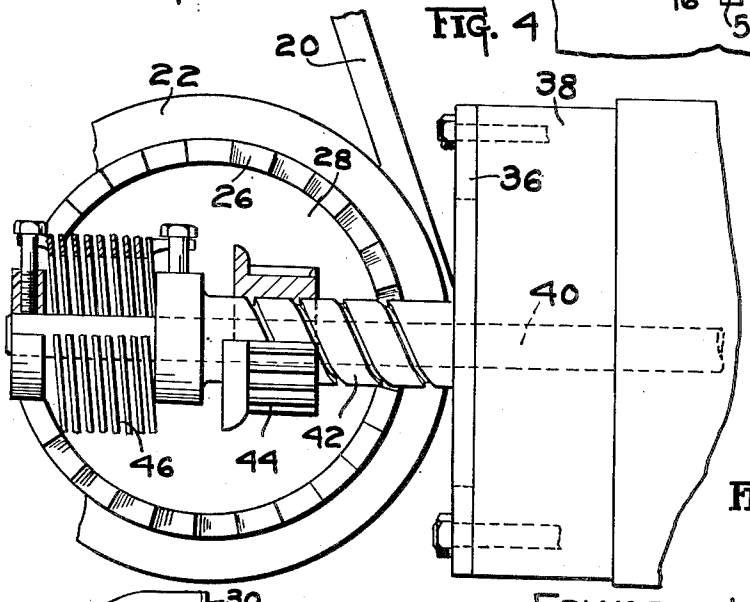


FIG. 2

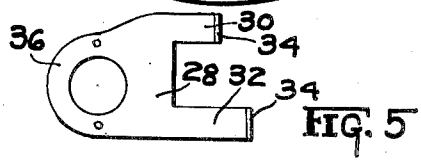


FIG. 5

INVENTOR.
EDWARD J. SMITH
BY
Chas R. Fay
ATTORNEY

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STARTING DEVICE

Edward J. Smith, Paxton, Mass., assignor to Silcraft Corporation, Worcester, Mass., a corporation of Massachusetts

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1 Claim. (Cl. 74—7)

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This invention relates to new and improved starting devices as applied particularly to gasoline or other internal combustion engines and the principal object of the invention resides in the provision of an easily attached device, or appliance to be secured to the engine or frame on which it may be mounted, as for instance for tractors and other power devices, and including a special gear and starter arrangement with means conveniently mounting the same in position to be effective to start the engine, in combination with new and improved battery supporting means therefor.

Another object of the invention resides in the provision of a special bracket adapted to be mounted on an engine or tractor frame and mounting a starting mechanism including an axially shiftable spur gear for selective engagement with a cup-shaped gear secured to a fly wheel for the engine for rotating the same for starting, and including a new and improved battery supporting bracket preferably located in position to balance the starting device.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings in which

Fig. 1 is a view in side elevation of a starter device of the class described, mounted in place on a small sized tractor;

Fig. 2 is an enlarged view of the starter;

Fig. 3 is a top plan view thereof on a reduced scale;

Fig. 4 is an enlarged view in side elevation of the battery supporting means; and

Fig. 5 is a view in elevation of the starter bracket.

The starting of gasoline and other internal combustion engines has always presented a problem particularly in engines of small size which are used in intermittent operation, but which at times are extremely difficult to start due to cold weather, etc. Most such small sized engines are started with a rope or belt and are not provided with any kind of self-starter both because of the added expense involved and because of the necessity of adding a relatively large amount of equipment to accomplish the purpose. This invention presents a relatively inexpensive dependable starting device of the class described which adds little in the form of equipment and which is of such a construction as to completely avoid interfering in any way with the practical operation of the engine whether used for a tractor or in any other way.

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Referring now to Fig. 1 there is shown a hand tractor having wheels 10 usually adapted to be driven by a gasoline or other internal combustion engine which is in this case mounted on a frame 12 mounted on the wheels 10. A pair of handles 14 are bolted to the frame at 16 forwardly of wheels 10 and these handles are adapted to steer the tractor. The gasoline engine may be provided with a crank shaft 18 driven by a belt 20 from a flywheel or pulley 22. In the ordinary starting of the device, pulley 22 is adapted to be rotated by a rope or belt wound about the portion 24 thereof, see Fig. 3.

This invention contemplates the securement of a cup-shaped gear 26 to the portion 24 of the pulley 22, gear 26 having a flat bottom 28 secured by bolting, welding, or any other means to the pulley 22, and having teeth at the rim or edge of the cup.

A bracket 28 having a pair of legs 30 and 32, the latter having feet 34, is arranged to be bolted to the frame 12 by bolts passing through the feet 34. This bracket has a circular conformation at 36 to which the starter motor 38 is bolted. The starter is provided with a central shaft 40 extending therethrough and outwardly thereof, see Fig. 5, this shaft being provided with a spiral threaded member 42 in mesh with a cut out or unbalanced spur gear 44. A take-up spring 46 is provided as in the usual starter.

The gear 44 is located within the confines of the cup-shaped gear 26 as shown in Fig. 2 and when the starter motor 38 is energized rotation of shaft 40 and member 42 causes gear 44 to move to the right and engage the rim teeth of gear 26 rotating the same and, therefore, rotating the crank shaft to start the engine. When the engine is going, the engine driven rotation of shaft 26 will cause the disengagement of gear 24 from the teeth of gear 26, as will be clear to those skilled in the art.

The starter motor 38 is energized through a solenoid switch 48 controlled by a push button 50 on one of the handles 14 so as to energize the starter motor directly through a cable 52 from a battery 54.

Bracket 56 is bolted to the frame 12 by bolt 16 and a duplication of this bracket at the other side of the tractor provides a support for a cross piece 58 on which is mounted a shelf 60 supporting the battery 54. Brackets 56 are provided with straps 62 having pivot pins 64 for a guard 66 and thus the brackets 56 support the battery and guard, and also the bolts 16 provide a pivot for the handles 50.

At the forward part of frame 12 there is provided a power take off having a cap 68. This power take off is controlled by a clutch operator 70 directly beneath the battery 54 but in position whereby the same may be easily actuated in spite of the present battery which is rigidly mounted due to the fact that the cross bracket 58 is seated firmly on the frame 12, which in this particular location is the transmission housing. The guard is pivoted on the pins 64 so as to be brought up out of the way while working on the engine.

It will be seen that this particular appliance may be easily and quickly mounted on the tractor and that very few parts are necessary for this purpose as well as providing against any interference with any parts of the tractor, its power take off, etc. In the case of the tractor illustrated, all tapped holes necessary are already present and no drilling or tapping is required in assembling the starter to the tractor.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed otherwise than as set forth in the claim, but what I claim is:

A starter for an internal combustion engine, a flay wheel therefore, and a small wheeled tractor support for the engine, said starter comprising a bracket, means detachably securing the bracket to the support adjacent the fly wheel at right angles to the plane of the latter and offset to one side thereof, a starter motor on the bracket, the motor having a shaft, the shaft being parallel to the fly wheel and in front of the same, a battery to energize the motor, an axially shiftable starter gear on the shaft rotated thereby, a cup type gear on the fly wheel facing the shaft and the gear thereon, said cup type gear having a continuous series of teeth at the periphery thereof for engagement by the starter gear upon energization of the motor to drive the engine until it starts.

EDWARD J. SMITH.

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