Sept. 4, 1923. 1,466,926

O. BRISBOIS

ENGINE STARTER

Filed Feb. 6, 1922

Fig. 1

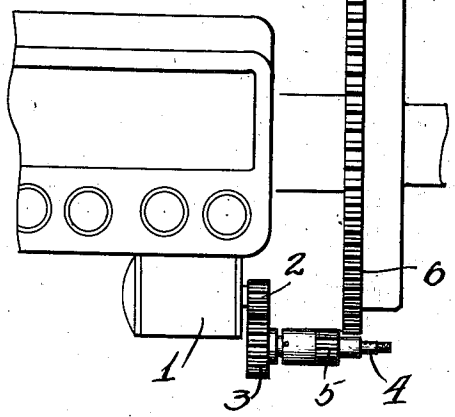


Fig. 3

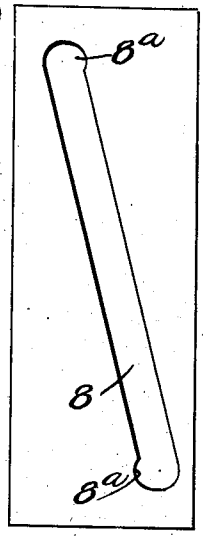


Fig. 2

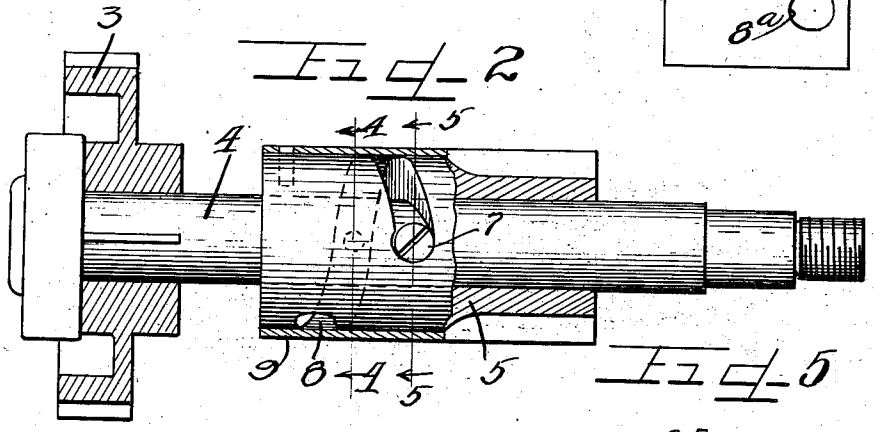


Fig. 5

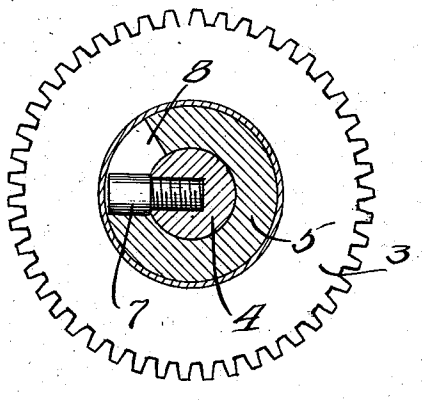
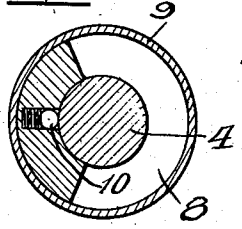


Fig. 4



Witnesses

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by Charles W. Kills Atty.

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UNITED STATES PATENT OFFICE.

ODILON BRISBOIS, OF CHICAGO, ILLINOIS.

ENGINE STARTER.

Application filed February 6, 1922. Serial No. 534,359.

To all whom it may concern:

Be it known that I, ODILON BRISBOIS, a citizen of the United States, and a resident of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in an Engine Starter; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the numerals of reference marked thereon, which form a part of this specification.

This invention relates to an engine starter of the type in which a driving member is automatically moved upon a screw threaded shaft into mesh with the engine fly wheel to start the engine when the starting motor is operated and which automatically moves out of mesh after the engine has started.

It is an object of this invention to simplify the construction of such starters, eliminating the screw threaded shaft and its accompanying objections and provide a device that is more readily responsive for the functions it is intended to perform.

With these and other objects in view which will become more apparent in the following description and disclosures, in the drawing, this invention comprises the novel mechanism and combinations hereinafter described and more particularly pointed out and defined in the appended claim.

In the accompanying drawings which illustrate one form of my invention and in which similar reference numerals refer to similar features in the different views:

Figure 1 is a plan view of my engine starter applied to an internal combustion engine, a fragment of which is shown.

Figure 2 is an elevational view upon an enlarged scale of the driving shaft showing parts in section.

Figure 3 is a diagrammatic view showing the development of the spiral slot or guideway in the hub of the driving gear.

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

Figure 5 is a section on the line 5—5 of Figure 2.

In referring to the different figures of the drawing, it will be noted that I have illustrated a starting motor 1 having a spur gear 2 upon the motor shaft which meshes with a spur gear 3 upon a driving shaft 4. A driving member 5 in the form of a gear or pinion is mounted upon the shaft 4 for longitudinal movement thereof and rotary movement therewith. The gear 5 is adapted to be brought into mesh with a gear 6 formed on the engine fly wheel or the like for turning over or starting the internal combustion engine of an automobile.

My inventiton concerns itself primarily with the novel structure whereby the driving member 5 is caused to move longitudinally on the driving shaft 4 and to rotate therewith. The means for accomplishing this purpose comprises a stud 7 secured to the driving shaft 4 and a helical slot or guideway 8 in the hub of the gear 5 in which the stud operates. The stud 7 is so positioned upon the shaft 4 and the slot 8 so designed that the gear 5 can move sufficiently in a longitudinal direction to mesh with gear 6 and move sufficiently in a reverse direction to completely demesh therewith. The slot or guideway 8 is closed at its ends which form stops and limit the longitudinal movement of the gear 5, and the ends of the slot are provided with lateral depressions 8^a in which the stud may enter, to prevent creeping of gear 5 especially when it is in its idle position. If desirable the hub of the gear 5 may be sheathed in a sleeve 9 to protect the same; and to further prevent the gear 5 from creeping when in its idle position, a small frictional spring pressed plunger or ball 10 (Figure 4) may be positioned in a small bore extending inwardly from the axis of said gear, so that the ball will be yieldingly held in frictional contact with the periphery of the shaft 4.

In the operation of the starter, the motor 1 is started to rotate the shaft 4 though the aforementioned gears 2 and 3. The shaft 4 will rotate independently of the gear 5 since the friction engendered between the stud 7 and the walls of the spiral guideway is substantially negligible and not sufficient to overcome the inertia of the gear 5. Therefore rotation of the shaft 4 will move the gear 5 longitudinally through the instrumentality of the stud 7 moving in the spiral guideway. Assuming that the gear 5 is in the position illustrated in the drawing, the gear 5 will move longitudinally to the right until the stud 7 reaches the left hand end of the spiral guideway at which time the gear 5 will have been brought into mesh with the engine fly wheel. When the stud 7 reaches the left hand end of the spiral guide-

way, the gear 5 will be constrained to rotate with the driving shaft 4 to start the internal combustion engine and as soon as the said engine has started under its own power, it will cause gear 5 to overrun the speed of shaft 4 and move longitudinally to the left and out of mesh with the fly wheel as is obvious. As the gear 5 is thus demeshed with the gear 6, it acquires a certain momentum which readily carries it far enough to the left until the stud 7 engages the right hand end of the slot and enters and lodges in the depression 8^a that tends to prevent creeping thereof.

It is characteristic of this invention that no weighted pinion or screw threaded shaft is used and that practically no friction is engendered between the connection of the driving shaft and the driving pinion, and that the spiral guideway or slot is designed to prevent creeping of the driving gear in its inoperative or idle position.

I am aware that numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I therefore do not purpose limiting the patent granted otherwise than necessitated by the prior art.

I claim as my invention:

In an engine starter, a driving shaft having a stud projecting radially therefrom, a gear loosely mounted on said shaft and having a spiral slot for receiving said stud, one end of said slot having a depression for receiving said stud and holding said gear from creeping when in inoperative position.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

ODILON BRISBOIS.

Witnesses:

LAWRENCE REIBSTEIN,

JAMES M. O'BRIEN.