

H. L. MEEDER.
STARTER FOR AUTOMOBILE ENGINES.
APPLICATION FILED APR. 12, 1919.

1,418,449.

Patented June 6, 1922.

3 SHEETS—SHEET 1.

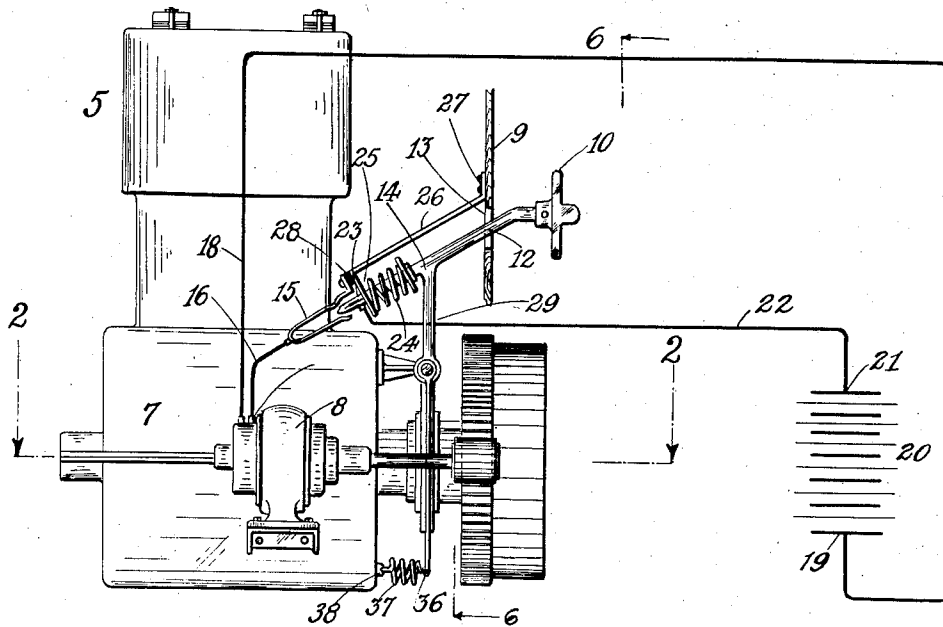


Fig. 1.

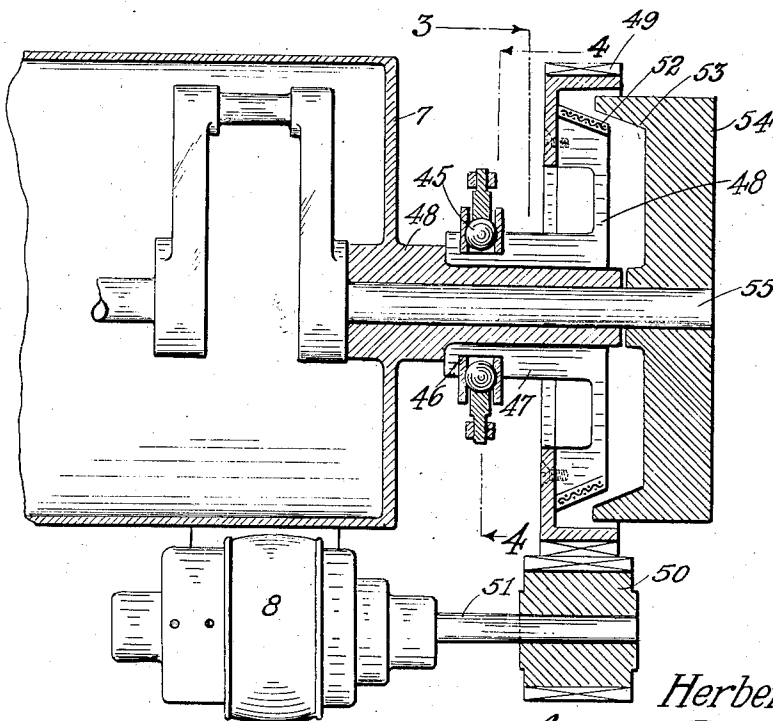


Fig. 2.

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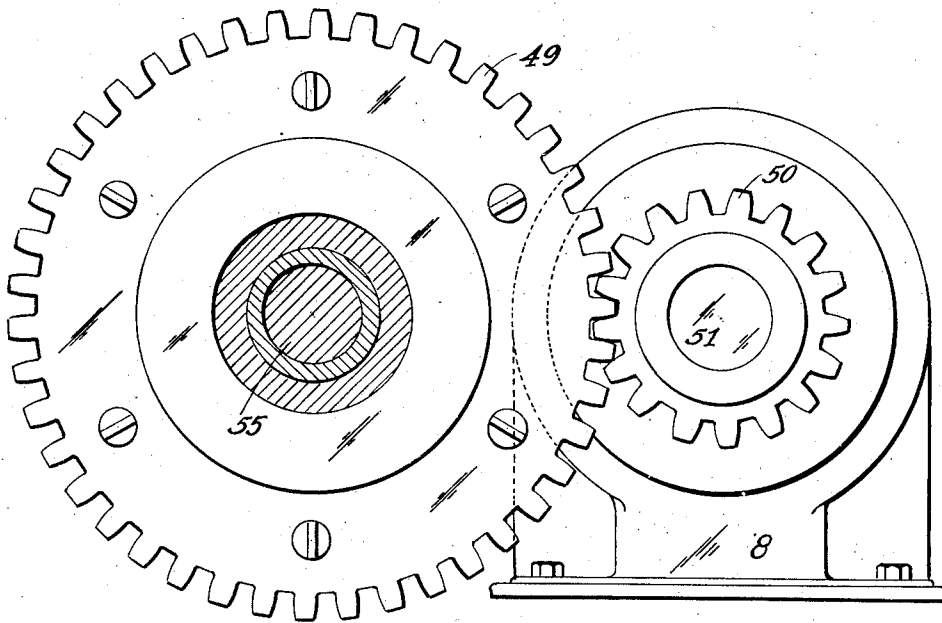


Fig. 3.

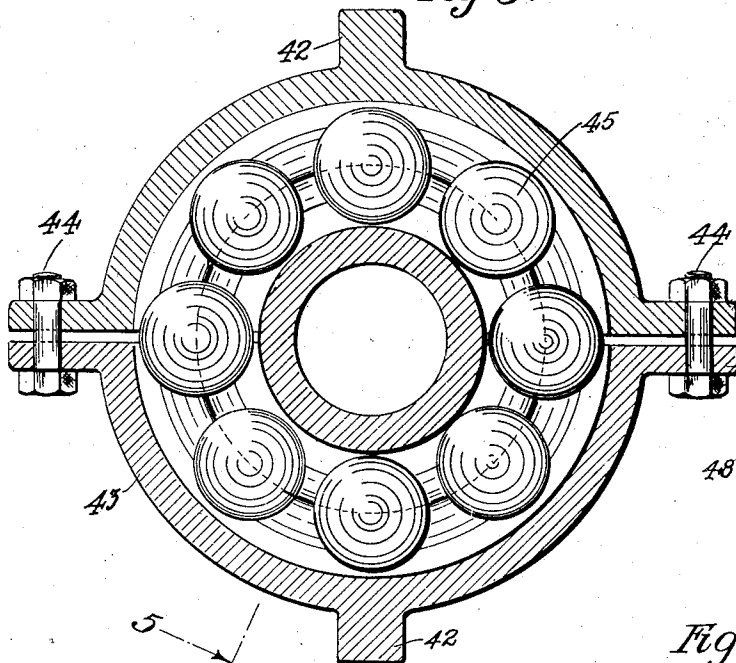


Fig. 4.

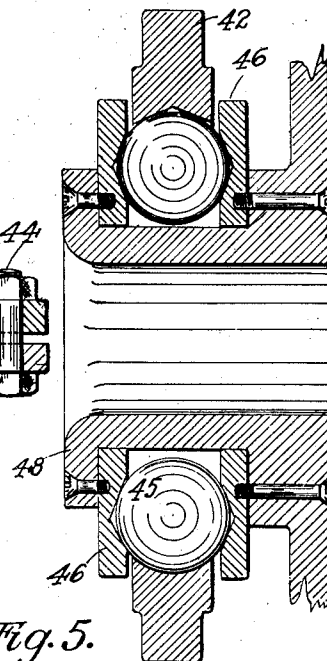


Fig. 5.

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3 SHEETS—SHEET 3.

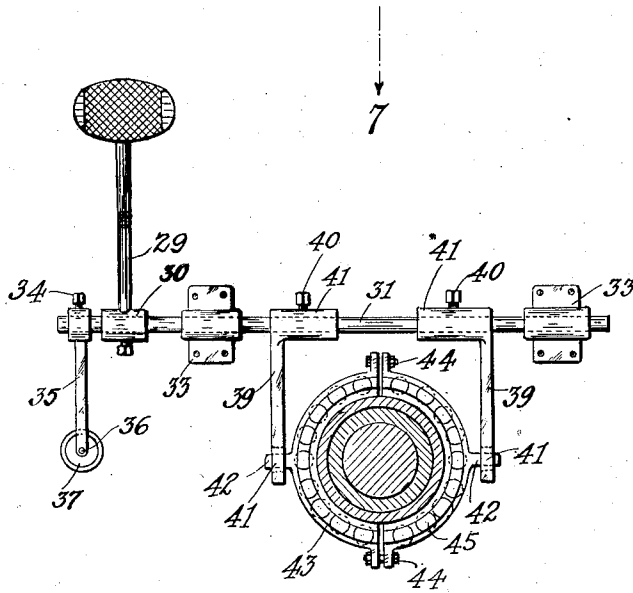


Fig. 6.

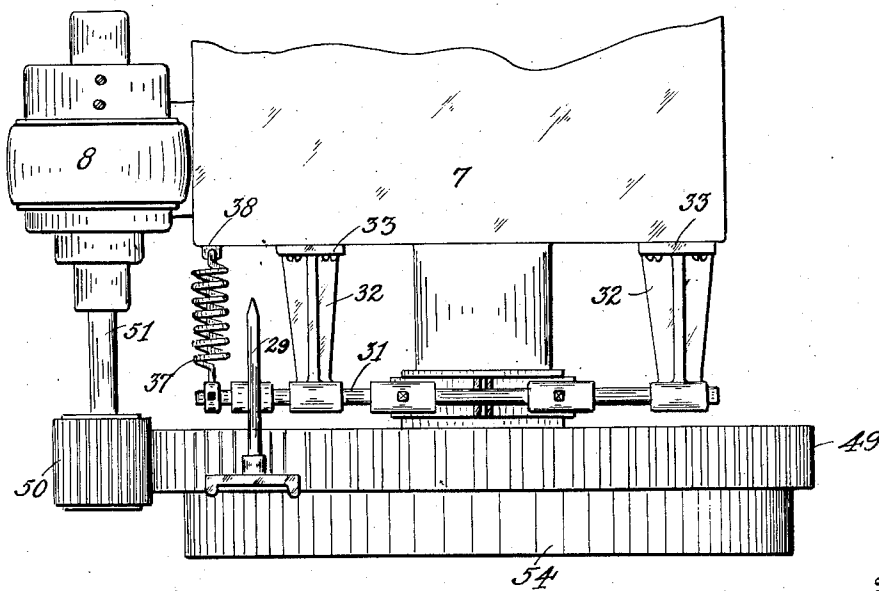


Fig. 7.

Inventor
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By

A. J. [Signature]
 Attorney

UNITED STATES PATENT OFFICE.

HERBERT L. MEEDER, OF DENVER, COLORADO, ASSIGNOR OF THREE-EIGHTHS TO LEWIS S. HALL AND TWO-EIGHTHS TO JOHN INGLIS, BOTH OF DENVER, COLORADO.

STARTER FOR AUTOMOBILE ENGINES.

1,418,449.

Specification of Letters Patent.

Patented June 6, 1922.

Application filed April 12, 1919. Serial No. 289,676.

To all whom it may concern:

Be it known that I, HERBERT L. MEEDER, a citizen of the United States, residing at the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Starters for Automobile Engines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in starters for internal combustion engines, used in connection with automobiles, my object being to provide a construction of this class which shall be more efficient than those heretofore in use so far as I am aware.

Automobile starters are usually operated by electric motors, and those with which I am familiar and which are most generally in use, involve the movement of a pinion into engagement with a gear connected in operative relation with the engine shaft, the pinion being normally out of mesh with the gear. This movement of the pinion from a position on its shaft out of mesh with the gear connected with the engine shaft, involves a difficulty, since the cogs of the two gears are not always in alignment so that the cogs of the pinion will move promptly into mesh with those of the gear, and when the pinion is interrupted in its movement, the starting function, of course, can not be performed.

My improvement is intended to overcome this difficulty, and it is so constructed that the pinion on the motor shaft is always in mesh with the gear on the engine shaft. The said gear, however, is normally loose with reference to the engine shaft, but adapted to be shifted, and is movable into clutching relation with the flywheel of the engine shaft, said operation being accomplished by the same act which closes the circuit of the starting motor, the said clutching relation being established shortly after the closing of the motor circuit, so that the clutching gear shall be in rotation before it is interlocked with the flywheel. Hence, in my improved construction, the motor pinion is always in mesh with the gear to be rotated

thereby for the performance of the engine-starting function.

Having briefly outlined my improvement, I will proceed to describe the same in detail, reference being made to the accompanying drawing, in which is illustrated an embodiment thereof. In this drawing:

Fig. 1 is a view illustrating an automobile engine and showing my improvement arranged in operative relation therewith.

Fig. 2 is a horizontal section taken on the line 2—2, Fig. 1, looking downwardly or in the direction of the arrows, the parts being shown on a larger scale.

Fig. 3 is a section taken on the line 3, Fig. 2, looking toward the right, the parts being shown on a still larger scale.

Fig. 4 is a section taken on the line 4—4, Fig. 2, looking toward the left, the parts being shown on a larger scale.

Fig. 5 is a section taken on the line 5, Fig. 4.

Fig. 6 is a section taken on the line 6—6, Fig. 1, looking toward the left, the parts being shown on a larger scale, and parts being omitted.

Fig. 7 is a fragmentary top plan view looking in the direction of arrows 7, Fig. 6.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate the internal combustion engine of an automobile, 7 the crank case, 8 the starting motor, and 9 the dash. The starter pedal, 10, is connected with an arm 12, which passes through an opening 13 in the dash. This arm, as shown in the drawing, extends downwardly and forwardly from a point 14, its point being tapered to enter a bifurcated spring electric contact, 15, which is connected by means of a conductor, 16, with a motor 8, as shown at 17; the other conductor, 18, leading from the motor to one pole 19 of the battery 20 while from the opposite pole, 21, of the battery, a conductor 22 leads to the circuit-closing part, 23, of the pedal arm 12. This part 23 is normally held out of engagement with the contact 15 by a spiral spring 24, which is placed between a stop 25 formed on a bracket 26, secured to the dash as shown at 27. This bracket is insulated from the contact 15, as shown at 28. From the point 14 of the arm 12, a part 29 extends downwardly, and is connected as shown at 30 with

a rock shaft 31, which is journalled in brackets 32, secured to the crank case as shown at 33. Connected with the rock shaft by means of a set bolt 34, is a downwardly extending arm, 35, whose lower extremity is connected as shown at 36, with one extremity of a spiral spring 37, the opposite extremity of the said spring being connected with the crank case as shown at 38. This spring cooperates with the spring 24 to maintain the rock shaft and its connections in a position corresponding with the open circuit position of the part 23 of the pedal arm 12.

15 The rock shaft 31 is further provided with two downwardly extending arms 39, which are adjustably connected with the rock shaft by set bolts 40 passing through sleeves 41, with which the arms 39 are provided. The lower extremities of these arms are connected as shown at 41 with trunnions 42 formed on a ring 43, which, as shown in the drawing, is composed of two parts connected by bolts 44. This ring engages a ball bearing construction 45, located in a circumferential groove 46, formed in a sleeve 47, slidable on a stub shaft 48, with which the crank case is provided. The sleeve 47 is formed integral with the web 48 of a gear 49 normally meshing with a pinion 50, fast on the shaft 51 of the starting motor. Furthermore, the gear 49 is provided with an interior beveled friction face, 52, which is normally out of engagement with an opposing face, 53, formed on the flywheel 54 of the engine crank shaft 55. The two springs 24 and 37 normally serve to maintain the two friction faces 52 and 53 of the gear and flywheel respectively out of contact, and corresponding with the open circuit position of the part 23 of the pedal arm, as will be readily understood.

From the foregoing description, the use and operation of my improved engine starter will be readily understood. Assum-

ing that it is desired to start the engine, the operator will press the pedal 10 forward, which will cause the part 23 of its arm to enter the bifurcated contact 15, whereby the circuit is immediately established through the motor 8, and before the pedal has been moved a sufficient distance to bring the friction faces 52 and 53 into contact. In other words, the pinion 50 and the gear 49 are well under way before the pedal has been moved sufficiently to bring the said friction faces into engagement for starting the engine. For this reason the contact 15 is made relatively long in order to allow the part 23 a considerable movement after the closing of the motor circuit. From this it will be understood that the starting of the engine may be quickly and easily accomplished through the medium of a mechanism in which the starter pinion is always in mesh with the gear which performs the starting function, the said gear, however, being normally loose with relation to the engine shaft as heretofore stated.

I claim:

A starting device for an internal combustion engine comprising, in combination, an engine shaft, a flywheel on said shaft, a tapering gripping surface on one side of said flywheel, a clutch member mounted concentric with said shaft and having a tapering surface for engaging with the tapering surface of said flywheel, gear teeth on the external periphery of said clutch member, a motor mounted on the engine frame, a pinion rotated by said motor in engagement with the gear on said clutch member, means for closing the circuit to said motor and for moving the clutch member into engagement with the gripping surface of said flywheel, said means comprising a member pivoted to the engine frame and engaging with said clutch member.

In testimony whereof I affix my signature.

HERBERT L. MEEDER.