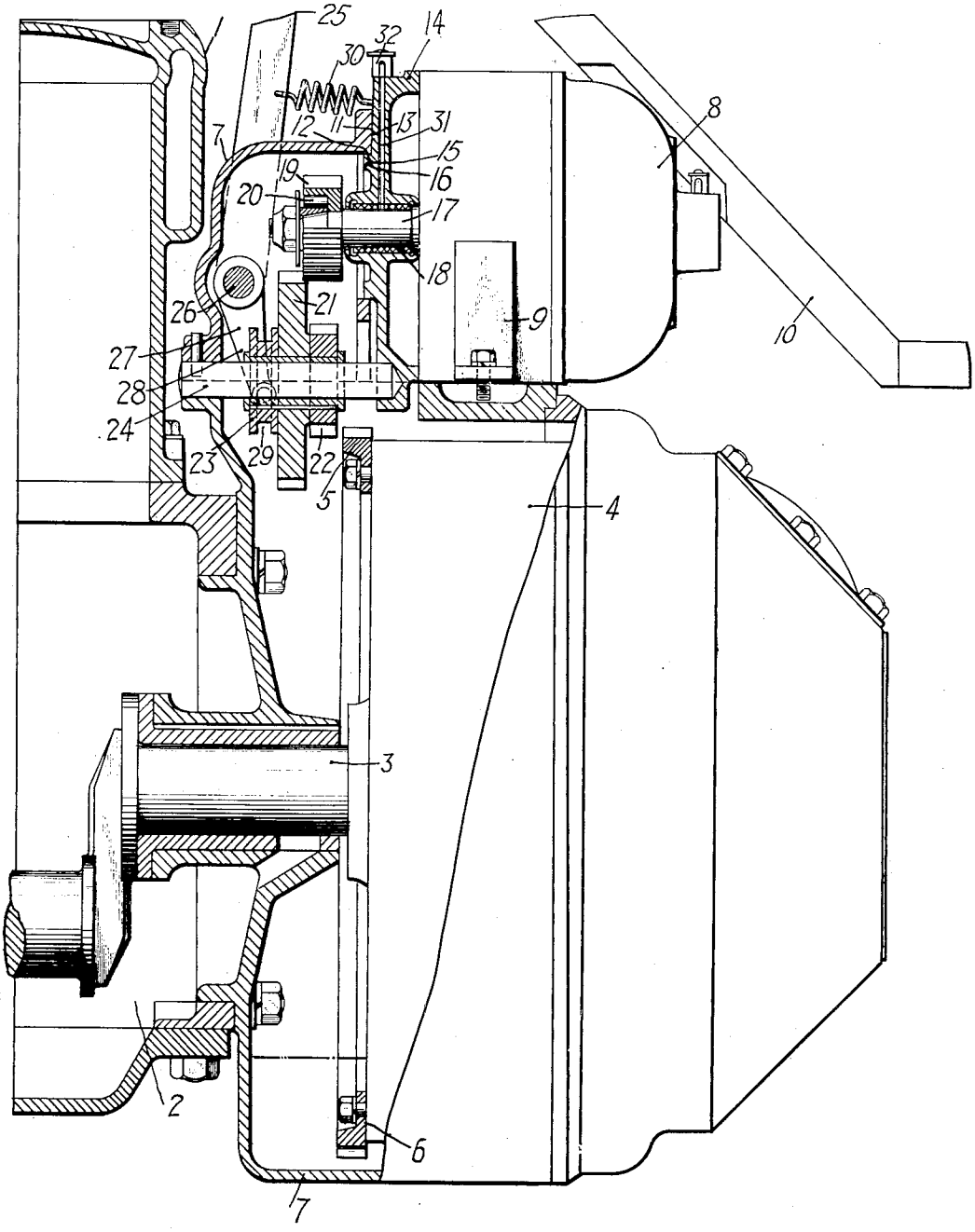
C. E. WILSON.

AUTOMOBILE STARTER.

APPLICATION FILED MAY 7, 1913.

1,175,326.

Patented Mar. 14, 1916.



WITNESSES:

J. Ridge.

J. R. Langley

INVENTOR

Charles E. Wilson

BY

Wesley G. Carr

ATTORNEY

UNITED STATES PATENT OFFICE.

CHARLES E. WILSON, OF WILKINSBURG, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

AUTOMOBILE-STARTER.

1,175,326. Specification of Letters Patent. Patented Mar. 14, 1916.

Application filed May 7, 1913. Serial No. 766,141.

To all whom it may concern:

Be it known that I, CHARLES E. WILSON, a citizen of the United States, and a resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Automobile-Starters, of which the following is a specification.

My invention relates to automobile starters and it has particular reference to that type of starter in which a motor and gear mechanism are employed.

One object of my invention is to provide a simple and compact structure for mounting a starting motor and connecting it to the engine shaft of an automobile or other motor vehicle.

A further object of my invention is to provide a means for protecting and lubricating the gear mechanism employed to connect the starting motor to the engine shaft.

In the use of motors for starting the engines of automobiles, it is desirable, in the interest of economy of space and convenience in assembling, that the motor and the gear mechanism be located adjacent the point of attachment to the engine shaft. To accomplish the above result, I propose to mount the motor immediately above the engine flywheel and to operatively connect the motor by means of any suitable gear mechanism to a gear wheel carried by the flywheel. By locating the motor in the position above described, it is possible to inclose the flywheel and the intermediate gear mechanism in a casing which protects the mechanism and affords a means for lubricating the bearings and engaging surfaces with oil splashed by the flywheel.

My invention is described in detail in connection with the accompanying drawings in which the single figure is a side view, partially in elevation and partially in section, of a portion of a gas engine with my invention applied thereto.

The rear portion of the gas engine of an automobile is shown in the drawings and it comprises a cylinder 1, a crank case 2, a crank shaft 3, and a flywheel 4 which carries a gear wheel 5 that is bolted to the flange 6 of the flywheel. The gear wheel 5 may be constructed integral with the flywheel or teeth may be cut in the periphery of the latter. A housing 7 forms the end of the crank case 2 and incloses the flywheel 4 and the front of a starting motor 8. The motor 8 is attached by brackets 9 to a portion of the housing 7 that is immediately above the flywheel 4 and adjacent the foot board 10 of the automobile. The motor 8 is here shown as a dynamo-electric machine, although any type of motor desired may be used. The housing 7 is provided with machined surfaces 11 and 12 which respectively engage the machined surface 13 of the end casing 14 of the motor and the surface 15 of an annular boss 16 that is formed on the casing 14. This construction centers the motor and insures a close fit of the connecting parts.

The motor shaft 17 extends through a bearing 18 into the housing 7 and is provided with a pinion 19. The pinion 19 is connected to the shaft 17 by a one-way clutch of the roller type comprising rollers 20 mounted in inclined grooves (not shown). A gear wheel 21 meshes with the pinion 19 and is integral with or connected to a pinion 22 and a grooved collar 23. These members are slidably mounted on a fixed shaft 24, the teeth of the pinion 19 having sufficient length to remain in mesh with the gear wheel 21 as it is shifted on the shaft 24. When the pinion 22 is in mesh with the gear wheel 5, the operative connection of the motor 8 to the flywheel 4 is completed. During the normal operation of the engine, the pinion 22 is disengagaed from the flywheel gear 5. If desired, a single intermediate pinion may be substituted for the pinion 22 and the gear wheel 21.

The gear wheel 21 and the pinion 22 are shifted into operative position by a pedal or lever (not shown) which is mounted within convenient reach of the operator. The pedal is connected to a lever 25 that is fixed on a rock shaft 26 which carries a yoke member 27 provided with arms 28 to engage the groove 29 of the collar member 23. A spring 30 is connected at one end to the lever 25 and at the other end to any suitable stationary part and serves to return the parts to their respective normal positions.

Assuming that the parts are in the positions indicated in the drawing and it is desired to start the engine, the operator effects the engagement of the pinion 22 and the gear wheel 5 by the shifting mechanism above described. The motor is then operated through any suitable electrical con-

nections to start the engine under its own power. The operator then releases the pedal, and the spring 30, which is under tension, returns the shifting mechanism, the gear 21 and the pinion 22 to their inoperative positions. If the engine speeds up before the gear mechanism is disconnected and drives the pinion 19 above the motor speed, the roller clutch allows the pinion 19 to overrun the motor shaft 17 and the motor is thus protected against excessive speed.

The flywheel housing 7 is filled with lubricating oil to the level indicated by the dotted line in the drawing. The flywheel 4 and the gear wheel 5 splash or throw the oil to the top of the housing and effectually lubricate the gear mechanism and the bearing 18 of the motor. An additional means for lubricating the bearing 18 may be employed to insure a sufficient supply of oil, the excess oil flowing into the housing. An oil hole 31 in the motor casing 14 that is covered by a removable cap 32, comprises the usual form of lubrication.

It will be understood that many changes may occur to one skilled in the art and that such modifications may be made, without departing from the spirit of my invention, as fall within the limits of the appended claims.

I claim as my invention:

1. In a starting mechanism, the combination with an engine shaft and a gear wheel on said shaft, of a motor, gear mechanism comprising a one-way clutch for operatively connecting said motor to said engine shaft, and a housing which supports said motor and incloses said gear wheel and said gear mechanism.

2. In a starting mechanism, the combination with an engine shaft and a gear wheel on said shaft, of a housing for said gear wheel, a motor supported by said housing, said motor being mounted above said gear wheel, and gear mechanism comprising a one-way clutch inclosed by said housing for operatively connecting said motor to said gear wheel.

3. In a starting mechanism, the combination with an engine shaft and a gear wheel thereon, of a housing for said gear wheel, a starting motor supported and partially inclosed by said housing, and gear mechanism comprising a one-way clutch operatively connecting said motor to said gear wheel, said gear mechanism being inclosed by said housing.

4. In a starting mechanism, the combination with an engine shaft, a flywheel thereon, and a gear wheel rotatable with said flywheel, of a motor mounted above said flywheel, gear mechanism comprising a one-way clutch for operatively connecting said motor to said fly-wheel, and means for lubricating said gear mechanism, said means comprising an oil-containing casing which incloses said fly-wheel and said gear mechanism.

5. In a starting mechanism, the combination with an engine having a crank case and a crank shaft, and a flywheel on said crank shaft, of a motor, means comprising a one-way clutch for operatively connecting said motor to said fly-wheel, and a housing forming a portion of said crank case and inclosing said fly-wheel and said connecting means.

6. In a starting mechanism, the combination with an engine shaft and a gear wheel on said shaft, of a motor, means comprising a one-way clutch for operatively connecting said motor to said gear wheel, and a housing which incloses said gear wheel and said connecting means and supports said motor.

In testimony whereof, I have hereunto subscribed my name this 22nd day of April, 1913.

CHARLES E. WILSON.

Witnesses:

F. H. PATTEN,

B. B. HINES.