J. A. PARKINSON.

MOTOR STARTER.

APPLICATION FILED JULY 2, 1914.

1,257,520.

Patented Feb. 26, 1918.

2 SHEETS—SHEET 1.

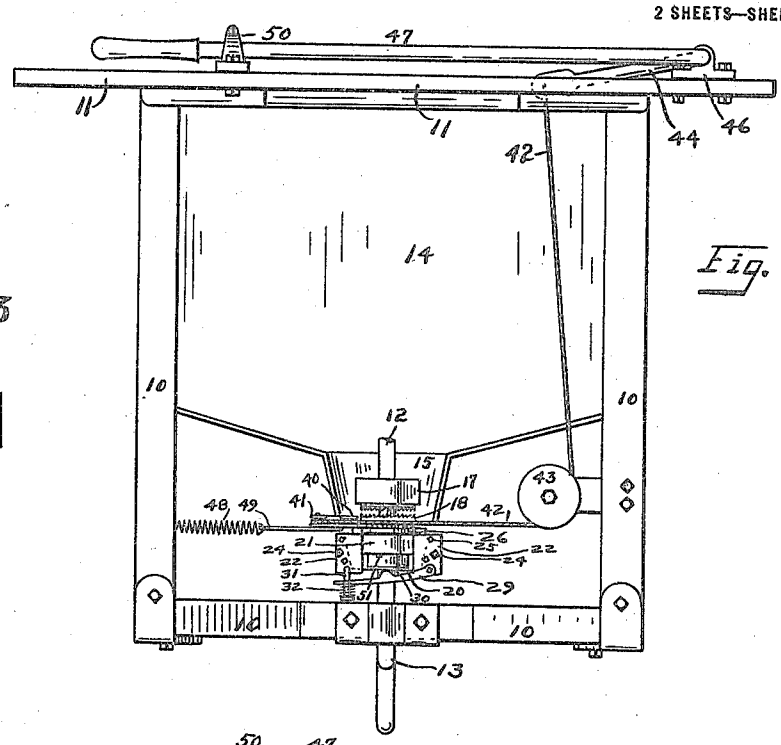


Fig. 2

Fig. 3



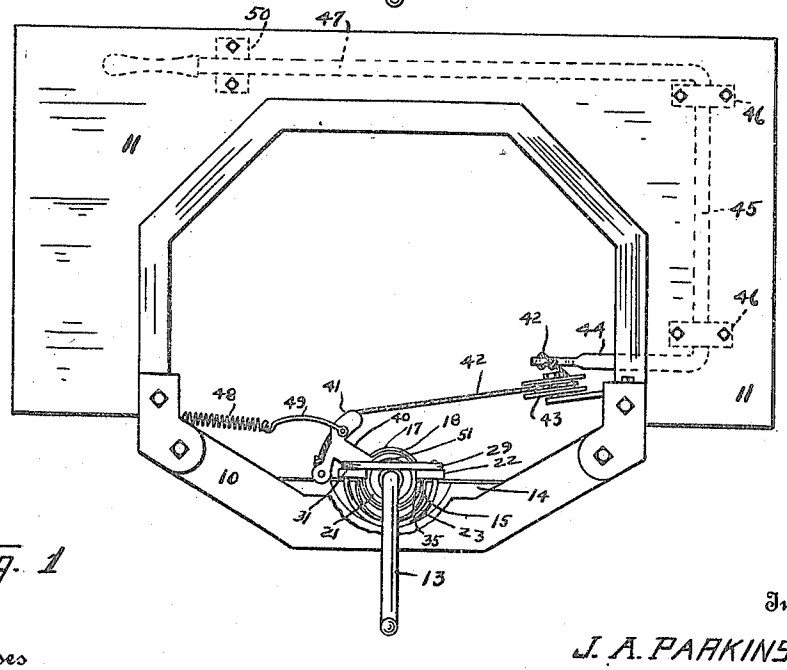


Fig. 1

Witnesses

R. W. McDonald

M. P. Crandall

Inventor

J. A. PARKINSON

By Milton S. Crandall,

Attorney

J. A. PARKINSON.

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2 SHEETS—SHEET 2.

Fig. 6

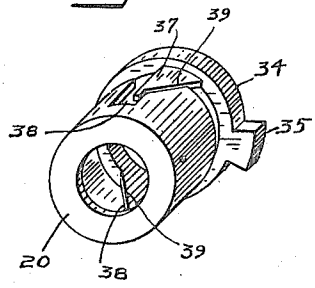


Fig. 7

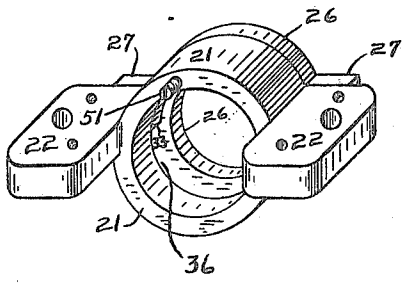


Fig. 5

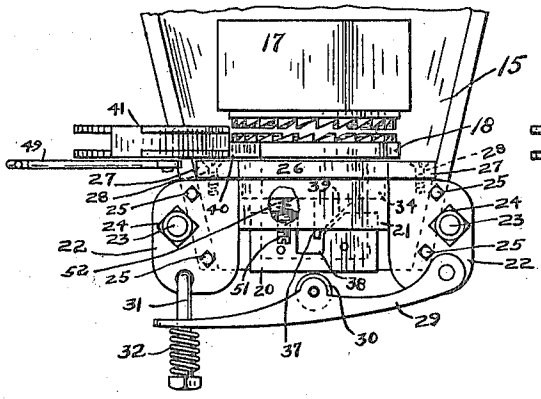


Fig. 8

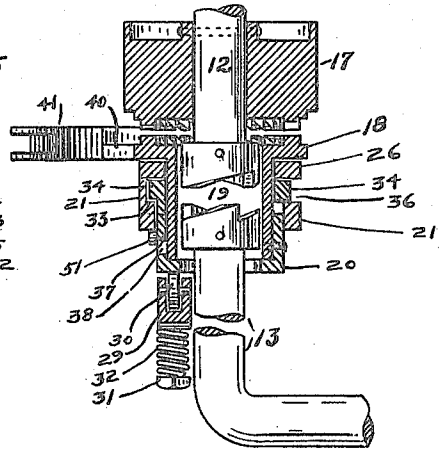


Fig. 4

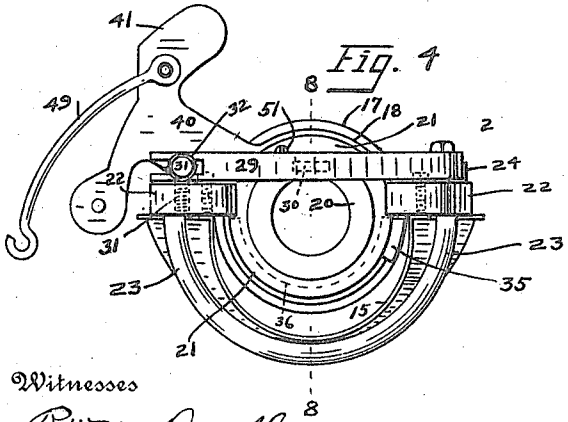
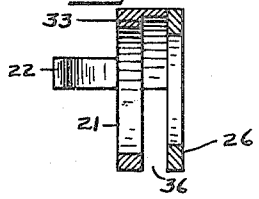


Fig. 9



Witnesses

R. W. MacDonald

M. P. Crandall

Inventor

J. A. PARKINSON

By Milton S. Crandall

Attorney

UNITED STATES PATENT OFFICE.

JOHN A. PARKINSON, OF SIOUX CITY, IOWA.

MOTOR-STARTER.

1,257,520. Specification of Letters Patent. Patented Feb. 26, 1918.

Application filed July 2, 1914. Serial No. 848,673.

To all whom it may concern:

Be it known that I, JOHN A. PARKINSON, a citizen of the United States, and a resident of Sioux City, in the county of Woodbury and State of Iowa, have invented certain new and useful Improvements in Motor-Starters, of which the following is a specification.

The present invention relates to means for starting gas-engines and more particularly engines employed for driving automobiles.

The invention has for its primary object the construction of an improved purely mechanical motor starter stable in construction and thoroughly dependable in operation.

Another object of the invention is the production in a device of this class of means for positively disengaging the actuating members in case of premature ignition.

A further object of the invention is the production of a motor starter particularly adapted for installation upon the great majority of automobiles.

With these and several other objects in view, the invention, consisting in the construction, combination and novel arrangement of parts, will be fully understood from the following description, reference being had to the accompanying drawings which form a part of this application and in which like characters of reference indicate corresponding parts throughout the several views, of which,—

Figure 1 is a fragmentary front elevation of an automobile chassis equipped with the device of my invention; Fig. 2 is a plan of the same; Fig. 3 is a side elevation of the hand-lever buffer; Fig. 4 is an enlarged front elevation of the starter; Fig. 5 is a plan of the same, a portion being cut away to reveal internal characteristics; Fig. 6 is a perspective view of the cam-faced collar and hub-guide; Fig. 7 is a similar view of the supporting bearing; Fig. 8 is a vertical longitudinal section of the device taken on the line 8—8 of Fig. 4 and showing the main-shaft and crank, each in part; and Fig. 9 is a central vertical section of the supporting bearing.

Although I have illustrated and herein described the preferred embodiment of the invention, I would not be understood as being limited to the specific structure chosen for illustration, for various alterations and modifications in the details of construction and arrangement of parts may be made without departing from the spirit and scope of the invention as defined in the appended claims.

The invention contemplates, broadly, mechanism including a ratchet-faced wheel mounted to turn with the main-shaft, and a second ratchet-faced wheel adapted to be turned at the will of the operator. Means are provided for automatically placing said wheels in and out of mutual engagement, according as the direction of turning of the latter wheel, all of which will presently be made clear.

Referring, now, particularly to Figs. 1 and 2, 10 represents the forward portion of the main-frame of an automobile chassis, equipped with the usual dash, 11, crank-shaft, 12, and starting-crank, 13. 14 is the pan, which is formed at its forward end, generally, with a concavo-convex neck, 15, which partially incloses the shank of the starting-crank and the adjacent end of the crank-shaft, and serves advantageously as a support for the preferred form of my invention.

17 is a ratchet-faced wheel, secured upon the crank-shaft and preferably formed with a broad periphery, thus adapting it to supplant the customary fan-belt-pulley. A second ratchet-faced wheel, 18, provided with an elongated hub, 19, freely inclosing the coacting ends of the crank-shaft and starting-crank, is alined axially with the fixed ratchet-wheel, the forward end of the hub being encircled by a band, 20, secured thereto and inclosed by a suitable bearing, as the collar, 21, having ears, 22, resting upon the flanged edges of the neck of the pan and clamped thereto by a U-bolt, 23, which incloses the neck of the pan and the ends of which protrude through the ears and are threaded to receive nuts, 24, screwed into firm engagement with the ears. To the front and rear of said nuts are set-screws, 25, threaded into the ears and screwed into engagement with the edges of the neck of the pan, and serving for leveling and alining the bearing. Adjacent the ratchet-faced rim 18 the hub is encircled by a ring, 26, having ears, 27, secured by screws, 28, to the supporting bearing. (Fig. 5.)

A lever, 29, is fulcrumed at one end upon one of the ears 22 and carries at its center a friction-roller, 30. The free end of said lever is bifurcated and incloses laterally a

bolt, 31, the rear end of which is bent downwardly and threaded into the adjacent ear 22. A compression-spring, 32, interposed between the head of said bolt and the lever, tends to force the free hatchet-wheel 18 toward its companion, by virtue of engagement between the friction-roller and the hub portion 20.

The rear end of the bearing is counter bored to provide a shoulder, 33, between which and the plate 26 is a collar, 34, freely encircling the hub 19 and provided with a radial tappet, 35, which protrudes through a semi-annular peripheral opening, 36, in the bearing, 21, and normally engages the bearing at the end of said opening. Upon the face of the collar 34 are lugs, 37, extending forwardly into longitudinal notches, 38, in the hub portion, 20. The said lugs are formed with oblique edges, 39, which coact with similarly formed edges of the notches in disengaging the crown-ratchets, as will presently appear.

The free ratchet-wheel carries a radial arm, 40 terminating in a segment, 41, the rim of which is channeled to receive a flexible link, 42, which passes around a direction-pulley, 43, mounted upon the chassis; one end of said link being secured to the lower end of said segment and the other end to an arm, 44, extending laterally from an upright shaft, 45, journaled in bearings, 46, mounted upon the rear side of the dash. The upright shaft is provided at its upper end with a horizontal hand-lever, 47, rearward movement of which imparts traction upon the link 42 and the attached radial arm.

A spring, 48, secured at one end to the main-frame and at the other to a link, 49, pivoted on the arm 40, maintains the latter in normal position and retracts it when the hand-lever is released.

The hand-lever is received by a V-shaped buffer, 50, the arms of which tend to spring toward each other and engage opposite sides of the lever, thereby absorbing the shock incident to the retraction of the lever.

In starting the engine the driver draws the hand-lever toward him, whereupon the free ratchet wheel is turned and the hub thereof freed from the cams 37, thus permitting the said wheel to yield rearwardly and coact with its companion in turning the crank-shaft in the desired direction. It will be observed that when the free ratchet-wheel thus starts to turn, the cam-faced collar 34 remains at rest until the edges of the cams opposite to their oblique edges are encountered by the adjacent edges of the slots 38, which causes the cam-faced collar to then turn in unison with the ratchet-wheel. When the free ratchet-wheel starts to retract, either from action of the attached spring or from premature ignition, the inclined edges of the cams and guide-ways coöperate in forcing the free ratchet-wheel out of engagement with its mate, reciprocation of the cam-faced collar being prevented, or retarded in any suitable manner until the ratchet-wheels are disengaged.

In the present embodiment, for thus retarding reciprocation of the cam-faced collar, a screw, 51, is threaded into the face of the supporting bearing and bears a compression-spring, 52, (Fig. 5) which slidably-engages the cam-faced collar.

My improvement in no way impairs the old method of cranking which may still be resorted to when spinning of the motor is necessary.

Another advantageous feature resides in the fact that there are no parts of my improved starter which require lubrication.

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

1. In a motor-starter the combination with the motor shaft of a ratchet-faced wheel mounted to turn with the shaft, a second ratchet-faced wheel mounted coaxially with said first wheel, one of said wheels being yieldably movable toward the other and having a taper-notched shouldered hub, a cam-faced collar encircling the hub and adapted to normally hold said movable wheel from the other wheel, and be turned and reciprocated by engagement with the hub, and operable when its reciprocation is retarded to coact with the hub to force the movable wheel from the other wheel, and means for retarding reciprocation of the collar.

2. In a motor-starter, the combination with the motor-shaft, of a ratchet-faced wheel mounted to turn with the shaft, a second ratchet-faced wheel mounted coaxially with said first wheel, one of said wheels being yieldably movable toward the other and provided on its side opposite the other wheel with a hub having an irregular peripheral shoulder adjacent its outer end, a cam-faced collar encircling the hub intermediate the shoulder and the adjacent side of the wheel, mounted to turn and reciprocate with the hub, and operable, when retarded, to force the movable wheel from the other wheel, and means for retarding the collar when it reciprocates.

3. In an engine-starter the combination with a crank-shaft and a ratchet-faced wheel mounted to turn the same, of a second ratchet-faced wheel, yieldably impelled toward said first wheel, adapted to be turned and reciprocated and having an irregular peripheral shoulder on its hub, a cam-faced collar encircling the hub, mounted against longitudinal movement and adapted to be turned with said second wheel and retarded

when reciprocating to force said second wheel from said first wheel, and means for retarding reciprocation of said collar.

4. In an engine-starter for automobiles, the combination with the crank-shaft and a ratchet-faced wheel mounted to turn the same, of a second ratchet-faced wheel yieldably impelled toward said first wheel, adapted to be turned and reciprocated and having a peripheral shouldered hub provided with tapered notches, a cam-faced collar encircling the hub and mounted against longitudinal movement, the cams being adapted to enter said notches to cause the collar to be turned with the hub, and when retarded in reciprocating, to force said second wheel from said first wheel, means for retarding reciprocation of the collar, and means for normally stopping said collar after reciprocation.

5. In an engine-starter for automobiles the combination with a fixed part of the chassis and the crank-shaft of a ratchet-faced wheel secured upon the crank-shaft, a bearing in axial alinement therewith and mounted upon the fixed part, a second ratchet-faced wheel having a forwardly-extending hub journaled in said bearing and having a peripheral shoulder on its forward end provided with tapered notches, yieldable means impelling said second wheel toward said first wheel, means controlled by the driver for actuating said second wheel, means for retracting the latter wheel, a cam-faced collar encircling the hub and mounted in said bearing against longitudinal movement, the cams being tapered to enter said notches whereby the collar is turned with said hub, means for retarding reciprocation of said collar when said second wheel starts to reciprocate, and means for normally stopping said collar.

6. In an engine-starter for automobiles, the combination with the crank-shaft, the starting-crank and a fixed part carried by the chassis, of a ratchet-faced wheel secured upon the crank-shaft adjacent the forward end thereof, a second ratchet-faced wheel having a forwardly-extending hub freely inclosing the contiguous ends of the crank-shaft and starting-crank, and having a peripheral shoulder adjacent its forward end, a bearing mounted upon said fixed part and supporting the hub, said bearing having an internal peripheral groove and a peripheral slot opposite said groove, a radial arm carried by said second wheel, a hand-lever fulcrumed for control by the driver, a connection between said lever and radial arm, a cam-faced collar encircling the hub, inclosed by said groove and having a radial stop disposed within said slot and normally engaged at one end thereof, yieldable means impelling said second wheel toward said first wheel, said cams being tapered and said shoulder being provided with tapered notches to receive the cams, and means for retarding reciprocation of said collar.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN A. PARKINSON.

Witnesses:
M. S. CRANDALL,
R. W. MCDONALD.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."