J. F. STANLEY.

MECHANICAL STARTER FOR AUTOMOBILES.

APPLICATION FILED SEPT. 7, 1915.

1,200,254.

Patented Oct. 3, 1916.

2 SHEETS—SHEET 1.

Fig. 1.

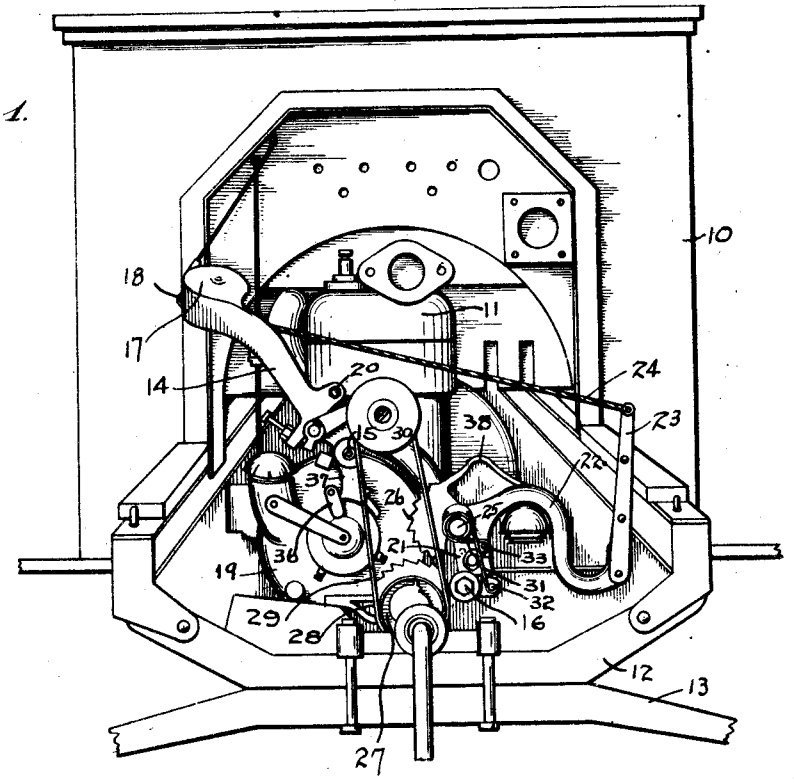
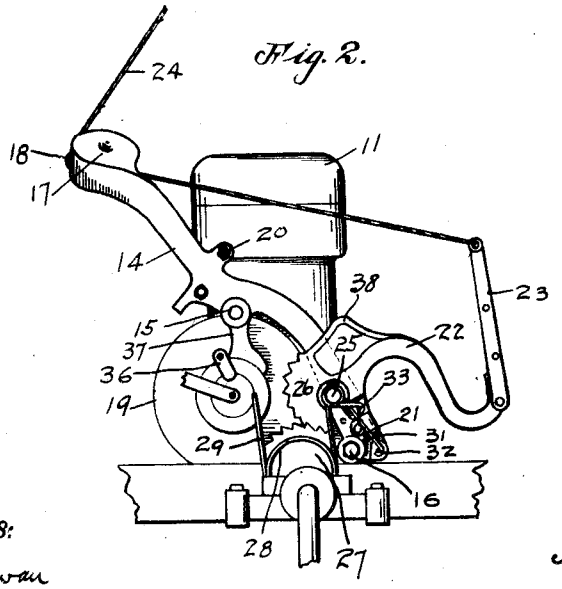


Fig. 2.



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Fig. 3.

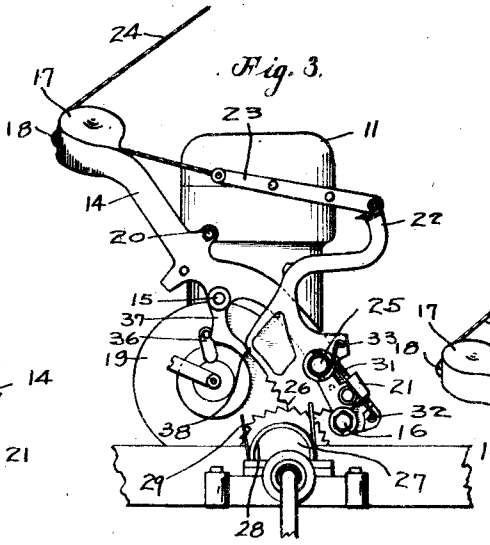


Fig. 8.

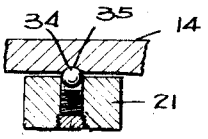


Fig. 7.

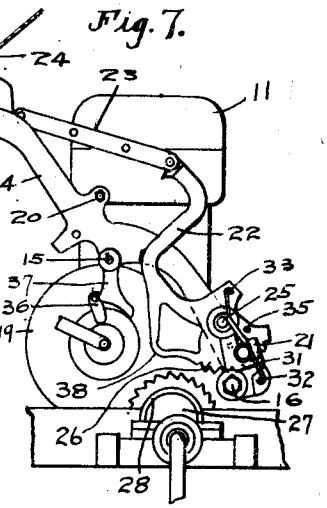


Fig. 4.

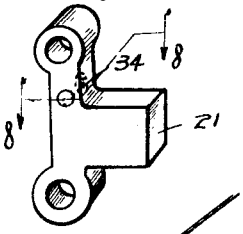


Fig. 5.

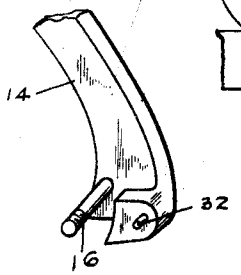
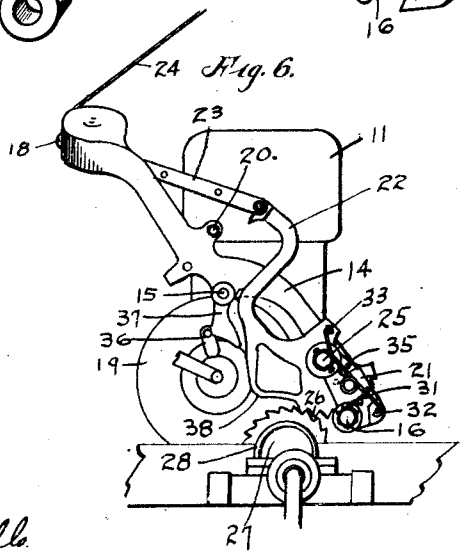


Fig. 6.



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JAMES F. STANLEY, OF ANDERSON, INDIANA, ASSIGNOR TO SIMPLEX MANUFACTURING COMPANY, OF ANDERSON, INDIANA, A CORPORATION.

MECHANICAL STARTER FOR AUTOMOBILES.

1,200,254. Specification of Letters Patent. Patented Oct. 3, 1916.

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To all whom it may concern:

Be it known that I, JAMES F. STANLEY, a citizen of the United States, and a resident of Anderson, county of Madison, and State of Indiana, have invented a certain new and useful Mechanical Starter for Automobiles; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like letters refer to like parts.

This invention relates to a mechanical starter of simple construction which is adapted to be used for starting motors. This particular starter, as shown herein, is especially adapted to be used on Ford motors and is so arranged that it may be quickly placed thereon without the rearrangement of parts.

One of the objects of this invention is to overcome the complexity of parts of mechanical starters, thereby eliminating the great amount of trouble incurred by the parts getting out of working order and at the same time produce a starter which is efficient in every way and fits compactly within the hood so as not to interfere with any of the parts or mechanism of the motor.

Another feature of the invention is the means connected with the starter for retarding the spark when the motor is about to be started, and for engaging and disengaging the driving means.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims:

In the drawings, Figure 1 is a front elevation of a motor and frame showing the starter in inoperative position. Fig. 2 is the same as Fig. 1, with parts removed, showing the starter in engaging position. Fig. 3 is the same as Fig. 2, showing the starter in its operative position. Fig. 4 is a perspective view of one member of the starter. Fig. 5 is a perspective view of the lower end of the stationary arm of the starter. Fig. 6 is the same as Fig. 2, showing the starter in its actuated position. Fig. 7 is the same as Fig. 2, showing the starter in position after being released. Fig. 8 is a section on the line 8—8 of Fig. 4.

In the drawings there is shown an automobile dash board 10, motor 11, frame 12 and springs 13. There is an arm 14 secured to the motor at 15 by a bolt which replaces the original bolt by which the fan bracket is secured to the frame of the motor, and at 16 by a bolt which replaces one that is originally used in securing parts of the frame together. Said arm has a jaw 17 in which a pulley 18 is secured, and extends downwardly and around a timing gear housing 19 to its lowest extremity where it is secured at 16. There is a lug 20 on said arm which bears against the surface of the cylinder for holding said arm firmly in position.

Pivoted to the arm 14 at 16 there is a member 21, as shown in Fig. 4, which is pivoted at its other end to a lever 22. Said lever is curved in such a way as not to interfere with the water pipe, not shown, extending from the motor to the radiator and will permit the maximum distance of movement in the smallest space. An arm 23 extends upward from said lever and is secured to a chain 24 which passes around the pulley 18 and through the dash board of the automobile where it is secured to a handle by which the driver may operate the starter. Said lever is fulcrumed at 25 to the member 21 and has on its other end a toothed segment 26.

A toothed wheel 27 is secured to the crank shaft in place of the fan pulley by means of a pin passing therethrough in a position to be engaged by said segment 26 when the mechanism is operated. Said toothed wheel has a pulley 28 integral therewith around which a fan belt 29 passes to operate a fan 30. The teeth of said wheel are so constructed that both faces thereof are inclined in opposite directions from a radial line through the wheel, one face of each tooth being inclined less than the other so that the teeth on the segment operate the teeth on the wheel only when a downward pressure is exerted by means of the lever. This construction of the teeth is such that the segment will properly operate the wheel, but will be thrown out of engagement therewith should there be a backfire of the engine.

There is a spring 31 secured at one end of said arm to a pin 32 and is looped around an outwardly extending lug at the fulcrum

point 25. The other end of said spring is secured to a pin on the lever 22 at 33. By means of this spring, when the lever 22 is pulled upwardly by means of the cable or chain, it rocks the member 21 with it. In order to aid in this movement there is a ball clutch 34 between the members 21 and the ratchet 26 which is adapted to be engaged by a recess 35 in said segment. Said member 21 is thereby held in engagement with the segment until said member reaches the position shown in Figs. 2 and 3, when the tension of the spring 31 overcomes the resistance of the ball clutch and said member is freed from said segment which then operates around the fulcrum point 25 instead of around the point 16. In the operation of the device there are two movements. The first movement is around the point 16 as an axis, whereby the segment 26 is forced down into engagement with the toothed wheel and the second movement is around the fulcrum point 25, whereby said segment operates and turns the toothed wheel against the tension of that portion of the spring 31 which is secured to the pin 33.

There is a spark control 36 against which a dog 37, pivoted at the point 15 to the arm 14, loosely rests so that under ordinary conditions said spark control may be freely operated. A projection 38 in the lever 22 is adapted to engage said dog when the lever reaches its extreme movement, thereby forcing it against the spark control and retarding it so that the starting mechanism automatically retards the spark when said mechanism is operated for starting the motor, thus lessening the danger of the motor back firing. This position is shown in Fig. 3. When the lever reaches its extreme position, as shown in Fig. 6, it engages the bolt 15 and forces the fulcrum point 25 upward and away from the wheel and at the same time, upon the lever being released, the spring 31 returns the member 21 to its original position. This movement elevates the segment so that it is disengaged from the wheel and returns to idle position. Should the motor back fire, the ratchet wheel itself will force the segment upward and out of engagement in the same way with the aid of the spring 31.

The operation of the device is as follows: When the lever is pulled by means of the chain, the segment is forced down in engagement with the ratchet wheel around the pivot point 16 because of the engagement of the ball clutch which moves the member 21 with the segment. After the segment has engaged the wheel, the ball clutch is thrown out of engagement and the segment continues to turn about the fulcrum 25. The projection 38 then comes into engagement with the dog 37 which retards the spark. When the lever reaches its extreme position, the segment is disengaged from the wheel by means of the lever coming in contact with the bolt 15 and forcing the member 21 back into its original position which carries the fulcrum 25 around the point 16 as an axis. The tension of the spring 31 then holds the member 21 in its position until the lever is released.

The invention claimed is:

1. A starter for an internal combustion engine including a shaft, a toothed wheel secured thereon, a frame secured to said engine, a pivot member pivoted at one end to said frame, a lever fulcrumed at the other end of said member, teeth on the end of said lever, means for operating said lever and engaging said teeth with said wheel, and means on said member for lifting and disengaging the teeth from the wheel when the movement of the lever is arrested.

2. A starter for an internal combustion engine including a shaft, a toothed wheel secured thereon, a stationary frame secured to said engine, a pivot member pivoted at one end to said frame, a lever fulcrumed between its ends at the other end of said member, means for operating said lever secured at one end, teeth on the other end thereof for engaging said wheel, and means on said frame for engaging said lever whereby said teeth will be thrown out of engagement with said wheel.

3. A starter for an internal combustion engine including a shaft, a toothed wheel secured thereon, a stationary frame secured to said engine, a pivot member pivoted at one end to said frame, a lever fulcrumed between its ends at the other end of said member, means for operating said lever secured at one end, teeth on the other end thereof for engaging said wheel, and a spring secured to said frame and lever adapted to allow said member to disengage and lift said teeth from said wheel.

4. A starter for an internal combustion engine including a shaft, a toothed wheel secured thereon, a stationary frame secured to said engine, a member pivoted at one end to said frame, a lever fulcrumed at the other end of said member, means for operating said lever, teeth on one end of said lever, and a ball clutch for engaging said member to said lever so that they will operate around a common axis for engaging said teeth with said wheel.

5. A starter for an internal combustion engine including a shaft, a toothed wheel secured thereon, a stationary frame secured to said engine, a pivot member pivoted at one end to said frame, a lever fulcrumed at the other end of said pivot member, teeth on one end of said lever, and a ball clutch in said pivot member for engaging said lever, whereby said teeth are meshed with said wheel.

6. A starter for an internal combustion engine including a shaft, a toothed wheel thereon, a toothed segment for engaging said wheel, said wheel and segment having teeth with both faces thereof inclined in opposite directions from a radial line through the wheel, and one face of each tooth being inclined less than the other, so that the teeth will disengage themselves in case the engine backfires.

In witness whereof, I have hereunto affixed my signature in the presence of the witness herein named.

JAMES F. STANLEY.

Witness:

J. H. WELLS.