

987,105.

Patented Mar. 21, 1911.

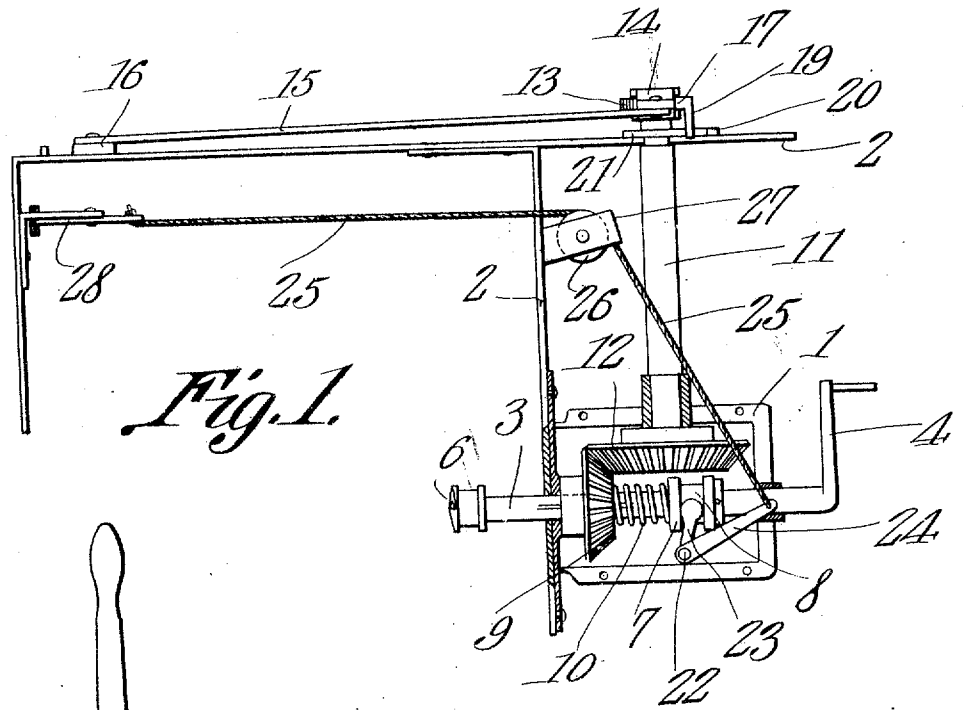


Fig. 1.

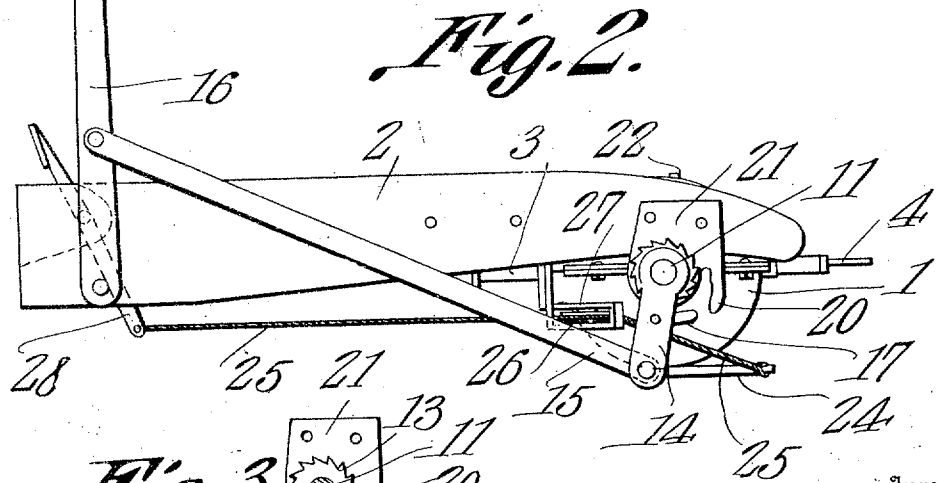


Fig. 2.

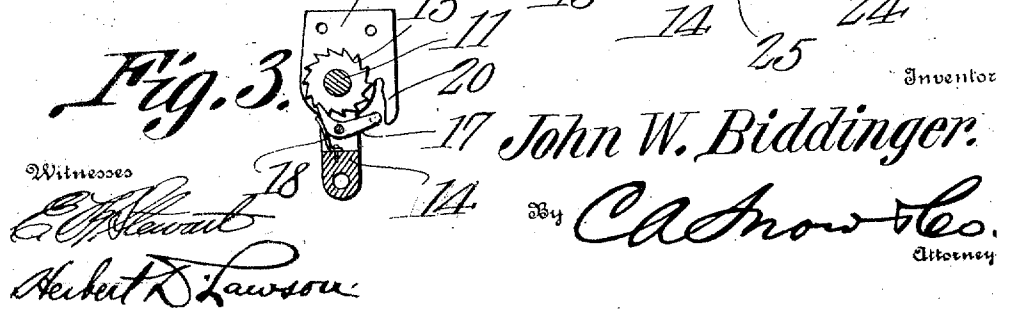


Fig. 3.

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UNITED STATES PATENT OFFICE.

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ENGINE-STARTER.

987,105.

Specification of Letters Patent.

Patented Mar. 21, 1911.

Application filed March 7, 1910. Serial No. 547,769.

To all whom it may concern:

Be it known that I, JOHN W. BIDDINGER, a citizen of the United States, residing at Washington, in the county of Daviess and State of Indiana, have invented a new and useful Engine-Starter, of which the following is a specification.

This invention relates to starters for hydrocarbon engines such as used upon automobiles and one of its objects is to provide improved means whereby the starting mechanism can be readily actuated by the chauffeur without leaving the vehicle, said mechanism being of simple construction and convenient to attach to different makes of machines.

Another object is to provide improved means whereby the actuating mechanism will be automatically disconnected from the starting shaft should the engine start backward as the result of premature sparking.

With these and other objects in view the invention consists in certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claims.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings. Figure 1 is a bottom plan view of the mechanism portions thereof being shown in section and the bottom of the gear case being removed. Fig. 2 is a side elevation of the starting mechanism. Fig. 3 is a section through the pawl and ratchet mechanism.

Referring to the figures by characters of reference 1 designates a gear case designed to be secured in any suitable manner to a fixed portion of the frame or chassis 2. A starting shaft 3 is journaled within the case 1 and may, if desired, be provided with a crank 4 at its outer end while the inner end of said shaft has a clutch case 5 designed to engage a corresponding face formed upon the adjoining end of the motor shaft, not shown. This shaft 3 is mounted to slide as well as rotate within its bearings and has a collar 7 secured upon it and provided with an annular groove 8. A gear 9 is feathered on the shaft 3, and is located within the case 1, there being a coiled spring on the shaft 3 and bearing at its ends against the collar 7 and the gear 9 respectively so as to hold the shaft 3 normally pressed forward with its

clutch face 6 out of engagement with the 55 motor shaft.

A shaft 11 is journaled within the case 1 and extends laterally therefrom and is also journaled in one side of the frame or chassis 2. This shaft has a gear 12 secured thereto and located within the case 1, the said gear meshing at all times with the gear 9. A ratchet wheel 13 is secured to the outer end of the shaft 11 and is located within the fork of an arm 14 which is mounted to swing loosely on the shaft 11. The free end of this arm is pivotally connected to one end of a rod 15 which is also pivotally connected to a starting lever 16. This lever is located at one side of the machine and preferably close to the chauffeur's seat. A pawl 17 is pivotally mounted within the forked arm 14 and a spring 18 bears on this pawl and holds it normally in engagement with the ratchet wheel. A finger 19 extends inwardly from the pawl and is adapted, when the arm 14 is swung a predetermined distance in one direction, to move against a deflecting arm 20 extending downwardly from a plate 21 which is secured to the 80 frame 2.

A shaft 22 is journaled within the top and bottom of the case 1 and extends through said case, there being an arm 23 on the shaft and within the case and which projects into the groove 8 in the collar 7. Another arm 24 extends from the lower projecting end of the shaft 22 and has a flexible actuating device, such as a cord, chain or the like which has been indicated at 25, the said device being secured to the free end of the arm 24 and being extended partly around a sheave 26 mounted upon a bracket 27 secured to the frame 2. The connection 25 extends back to the lower end of a foot lever 28 which is journaled within the frame 2 and preferably close to the seat of the chauffeur.

In using the mechanism which has been described the foot lever 28 is first pressed forward. This causes the connection 25 to pull on arm 24 and the shaft 22 is thus rotated so as to swing the arm 23 and push the collar 7 and the shaft 3 longitudinally. The clutch face 6 will thus be brought into engagement with the adjoining end of the motor shaft, not shown. It will be understood of course that the gear 9 remains in mesh with the gear 12 inasmuch as shaft 3

is slidably mounted within said gear 9. After the parts have thus been shifted the lever 6 is oscillated. Each forward movement of the lever will swing the arm 14 so as to cause the pawl 17 to ride over the teeth on the ratchet wheel. Each movement of the lever 16 in the opposite direction will cause the pawl to engage the ratchet wheel and rotate it. Shaft 11 will therefore, be correspondingly rotated and motion will be transmitted through gear 12 to gear 9 and thence to the shaft 3. As long as this shaft is in engagement with the motor shaft, the said motor shaft will be also rotated. Should the engine start in the wrong direction the movement of shaft 11 would be reversed, and the pawl, engaged by the ratchet wheel 13, would be thrown in the direction of the arm 20, thus causing arm 14 and rod 15 to suddenly pull the lever 16 away from the operator. Upon the completion of a short movement of the pawl 17 in this direction, the finger 19 on the pawl will ride against the arm 20 and said arm will deflect the finger inwardly a sufficient distance to disengage the pawl from the ratchet wheel. The clutch face 6 will of course become disengaged from the motor shaft as soon as the foot lever 28 is released, the spring 10 serving to promptly shift the shaft 3 longitudinally so as to disengage the two shafts.

It will be seen that starting mechanism such as has been described is very simple in construction and will be found advantageous because it can be readily applied to different makes of machines and because of the further fact that it becomes unnecessary for the chauffeur to leave the vehicle when he desires to start it.

Various changes can of course be made in the construction and arrangement of the

parts without departing from the spirit or sacrificing any of the advantages of the invention as defined in the appended claims.

What is claimed is:—

1. Mechanism of the class described including a starting shaft, a collar thereon, a gear feathered on the shaft, manually operated means engaging the collar for shifting the shaft longitudinally within the gear, a spring upon the shaft and bearing against the gear and collar to hold the shaft normally in a predetermined position, a second shaft, a gear thereon constantly meshing with the first mentioned gear, means movable in one direction for rotating said second shaft, and means for automatically disconnecting said shaft, and its rotating means when the shaft is rotating in the opposite direction.

2. Mechanism of the class described including a starting shaft having a clutch member at one end, a gear feathered upon said shaft, a spring on the shaft for holding the same normally in a predetermined position, an actuating shaft, a gear thereon, the two gears being constantly in mesh, a starting lever, mechanism operated thereby for rotating the operating lever in one direction, means for automatically disengaging the mechanism from the actuating shaft when said shaft is rotated in the opposite direction, and manually operated means for shifting the starting shaft out of normal position and longitudinally within its gear.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JOHN W. BIDDINGER.

Witnesses:

CLAUDE BRYAN,
FRED KIRCHNER.