Dec. 10, 1940. H. L. BOLDT 2,224,249

STARTING DEVICE

Filed Feb. 20, 1939

Fig. 1.

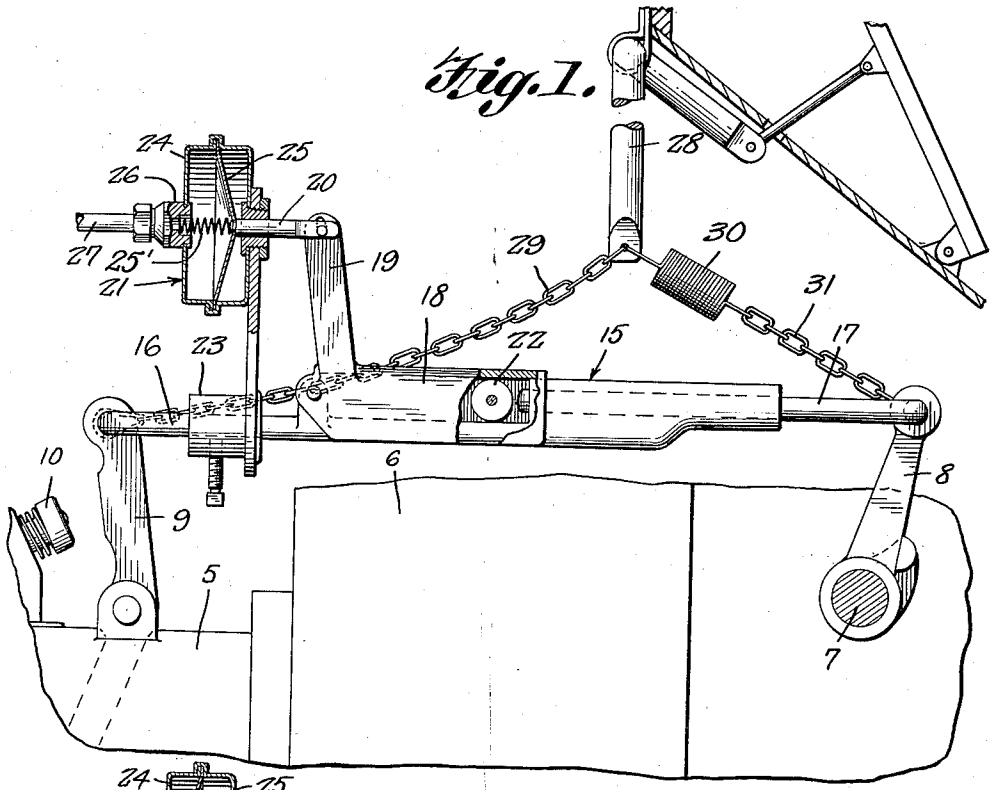
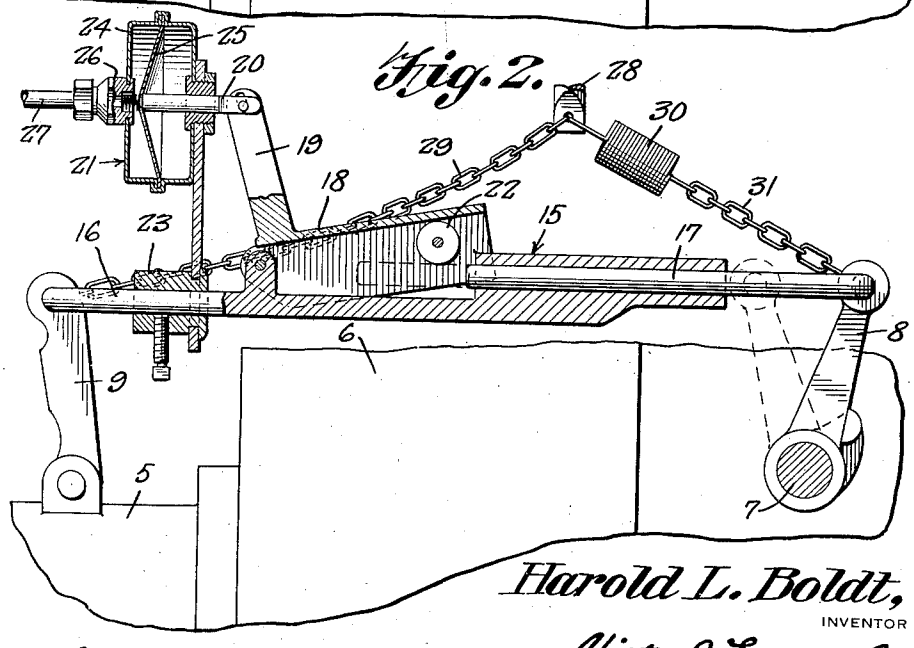


Fig. 2.



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Patented Dec. 10, 1940 2,224,249

UNITED STATES PATENT OFFICE

2,224,249

STARTING DEVICE

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Application February 20, 1939, Serial No. 257,526

4 Claims. (Cl. 192—.01)

My invention relates to starting devices and has particular reference to automatic control means whereby the starting motors of engines are actuated.

One object of my invention is to provide a starting device operated by a pedal which will become automatically disconnected relative to the starting motor as soon as the engine begins to turn under its own power.

Another object of my invention is to provide a device of the character described which is simple in construction, durable in use and efficient in operation as well as economical in manufacture.

Other objects and advantages will be apparent from the following description, appended claims and annexed drawing.

Referring to the drawing wherein like reference characters designate like parts throughout the several views:

Figure 1 is a side elevation of my invention, partly in section, as applied to the starting motor and clutch shaft of an engine.

Figure 2 is a view similar to Figure 1, but illustrating the invention in disconnected relation between the starting motor and the clutch shaft.

In practicing my invention, I provide a starting motor, a section of the casing being illustrated at 5 as connected to a portion of a fly-wheel casing 6. The fly-wheel casing 6 has extending transversely therethrough a clutch shaft 7 for operating the clutch of an engine and on which is fixed an arm 8, it being understood that the clutch shaft is operated by means of a foot pedal in the ordinary manner. Pivotally mounted on the casing 5 of the starting motor is an arm 9 constituting a contact lever and shift yoke, the latter being of an ordinary construction for engagement with a starting switch 10 and for shifting the starter gear carried on the shaft of the starting motor into engagement with the ring gear on the fly-wheel of the engine. The foregoing described parts are typical of a motor vehicle engine and per se form no part of the present invention.

My novel form of starting device comprises an elongated housing 15 having its front end 16 pivotally connected to the arm 9 and the rear end pivotally connected to the arm 8 fixed on the clutch shaft 7 by means of a rod 17 slidably mounted in the rear section of said housing. The housing has associated therewith a forwardly disposed inverted U-shaped carrier 18 pivoted or hinged at its front end to the front section of the housing. The carrier 18, at the front end thereof, is fashioned wtih an upwardly extending arm 19, the latter being slidably pivoted at its upper end to the outer end of a rod 20 of a vacuum device 21 connected with the intake manifold of the motor vehicle as hereinafter more fully set forth and said vacuum device operates to raise and lower the free end of the carrier 18 relative to said housing.

Rotatably mounted in the rear end of the carrier 18 is a roller 22 which lies normally adjacent the front end of the rod 17 slidably mounted in the housing. The rear end of the rod 17 extends beyond the rear end of the housing and is pivotally connected to the arm 8 fixed on the clutch shaft.

The front end of the housing has fixed thereon a sleeve 23 provided with an upwardly extending arm for supporting the vacuum device 21. The vacuum device comprises a cylinder 24 having centrally disposed therein a diaphragm 25. The inner end of the rod 20 is connected to the diaphragm and centrally thereof and a compression spring 25' is interposed between said diaphragm and a connection 26 secured to the wall of the casing on the opposite side from said rod 20 and said connection has secured thereto the end of a conduit 27 leading to the intake manifold of the engine. Obviously, upon starting of the engine, the diaphragm 25 will be flexed towards the connection 26, thereby moving the arm 19 through the medium of the rod 20 and which serves to raise the rear end of the carrier 18 for a purpose hereinafter set forth.

When the motor vehicle engine is not running, depression of the clutch pedal will cause the sliding rod 17 to contact the roller 22 and cause the entire housing to move forward with the result that the arm 9 will shift the starter gear into mesh with the ring gear on the fly-wheel and to contact the starter switch 10 which will cause the starting motor to start. Immediately upon operation of the starting motor, the vehicle engine starts and causes operation of the vacuum device 21, which, as heretofore stated, operates the arm 19 and raises the free end of the carrier 18, which disposes the roller 22 out of the path of the slidable rod 17 so that depression of the clutch pedal, while the motor is running, will not actuate the starting motor.

Arranged above the housing, is the lower end of a pivoted accelerator or rod 28, the latter having the upper end of a chain 29 attached thereto, the lower end of which is connected to the arm 9. Said lower end of the accelerator rod also has attached thereto the upper end of a coil spring 30, the lower end of which is connected by

a chain 31 to the arm 8. Obviously, when the arm 9 is shifted as heretofore described, the chain 29 will serve to operate the accelerator rod and which in turn opens the throttle to the engine. Upon operation of the engine and subsequent disposition of the roller 22 out of the path of the rod 17 together with release of the clutch pedal, the lower end of the accelerator rod 28 will be returned to normal position through the medium of the coil spring 30.

From the foregoing it will be apparent that I have provided a simple and efficient starting device adapted for use in connection with the clutch pedal and which, while the engine is running, will be disconnected relative to the starting motor.

It is also obvious that the invention is not confined to the herein described use therefor as it may be utilized for any purpose to which it is adaptable. It is therefore to be distinctly understood that the invention is not limited to the specific construction as illustrated and described, as the same is only illustrative of the principles of operation which are capable of extended application in advance forms, and that the invention comprehends all construction within the scope of the appended claims.

What I claim is:

1. A device of the character described, comprising, a housing adapted to be pivotally connected to the operating lever of a starting motor, a rod slidable in said housing and adapted to be pivotally connected to an arm fixed on a clutch shaft of an engine, a carrier pivotally mounted on said housing, a roller carried by said carrier and normally disposed in the path of said rod whereby operation of said rod towards said carrier engages said roller and causes movement of said housing with said rod, means connected to said carrier and operable upon the starting of said engine to dispose said roller out of the path of said rod, and a member adapted to connect said lever to the accelerator of said engine for moving said accelerator to engine starting position upon movement of said lever by said housing.

2. In combination with a clutch shaft and an operating lever of a starting motor of a motor vehicle engine equipped with an accelerator, an arm fixed on said clutch shaft, a starting device, comprising, a housing pivotally connected to said lever, an element movable on said housing and connected to said arm for movement therewith, a member movably mounted on said housing and equipped with an abutment normally disposed in the path of said element whereby operation of said clutch shaft serves to operate said lever through the medium of said housing, a vacuum device operable by said engine and connected to said member for disposing said abutment out of the path of said element upon starting of said engine whereby said clutch shaft is capable of operation without actuating said lever, and a member connecting said lever to said accelerator for moving the latter to engine starting position upon movement of said lever by said housing.

3. The structure defined in claim 1 including, and means adapted to connect said arm to said accelerator for moving said accelerator to engine idling position upon movement of said rod away from said carrier.

4. The structure defined in claim 2 including, means connecting said accelerator and said arm together for returning said accelerator to engine idling position upon movement of said arm away from said housing.

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