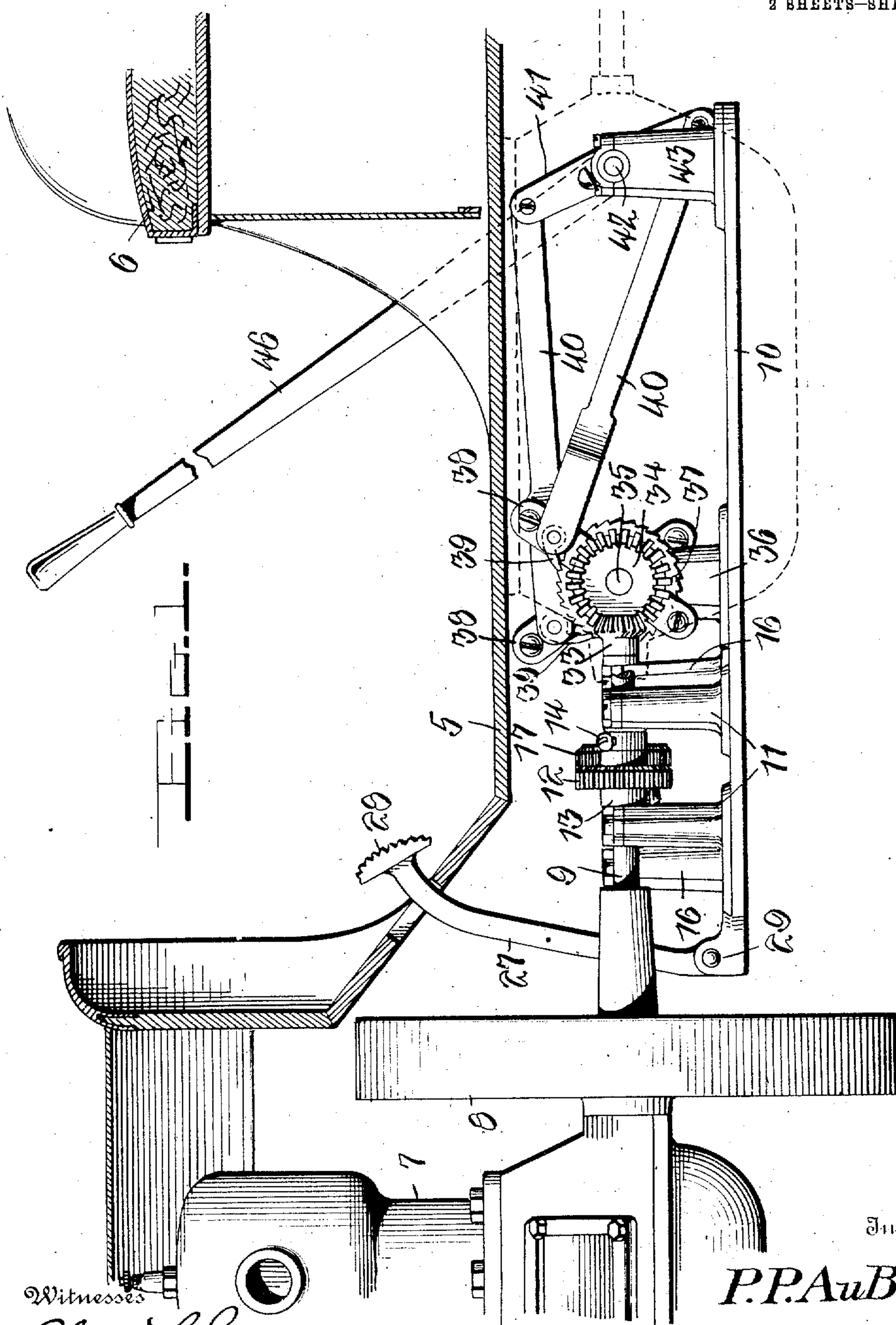


P. P. AU BUCHON.
ENGINE STARTING DEVICE.
APPLICATION FILED MAR. 9, 1910.

978,264.

Patented Dec. 13, 1910

2 SHEETS—SHEET 1.



Witnesses

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P. P. AuBuchon,

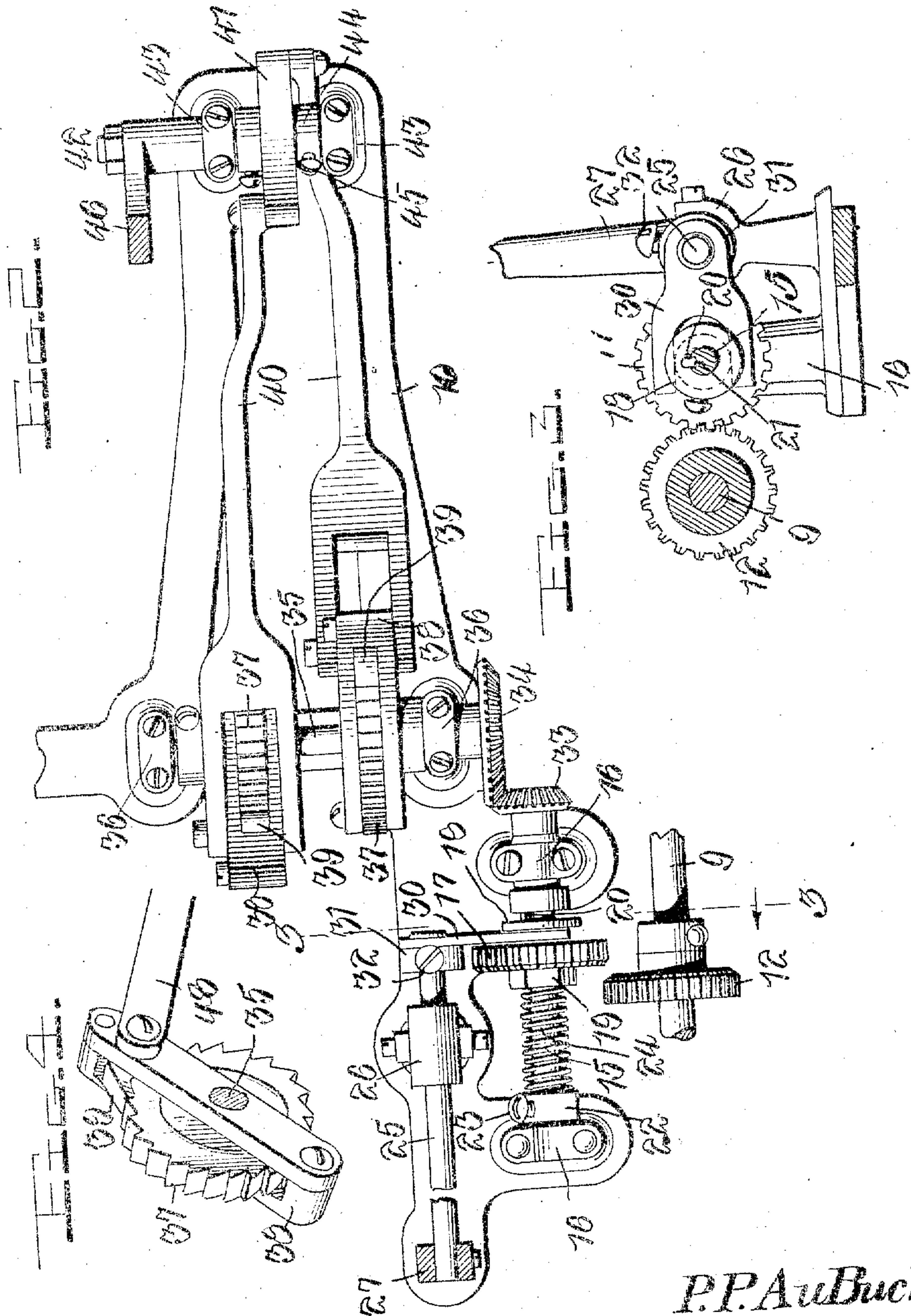
By

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Attorney

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UNITED STATES PATENT OFFICE.

PETER P. AU BUCHON, OF FRENCH VILLAGE, MISSOURI

ENGINE-STARTING DEVICE.

978,264.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, PETER P. AU BUCHON, a citizen of the United States, residing at French Village, in the county of St. Francois and State of Missouri, have invented certain new and useful Improvements in Engine-Starting Devices, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to engine starting devices and more particularly to a device of this character which is adapted for starting engines of motor vehicles and is so constructed and arranged that it may be operated from the vehicle seat occupied by the chauffeur.

Another object is to provide a comparatively simple device of this character which is so constructed and arranged that it can be conveniently mounted beneath the body of the machine and is capable of being rapidly operated to secure the necessary initial movement of the fly wheel of the engine to reciprocate the engine pistons.

A further object resides in the provision of improved mechanism of the above character which is adapted to be automatically thrown out of gear after the engine has been started, the starting gear being actuated by means of a suitable foot lever extending through the body of the machine.

With these and other objects in view, the invention consists of the novel features of construction and the combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of an improved engine starting device embodying my improvements showing the same arranged beneath the body of the vehicle and connected with the engine shaft; Fig. 2 is a top plan view of the starting mechanism removed; Fig. 3 is a transverse section taken on the line 3—3 of Fig. 2; and Fig. 4 is a detail perspective view of one of the ratchets and the yoke embracing the same.

Referring in detail to the drawings 5 indicates the body of a motor driven vehicle, and 6 the operator's seat. An engine 7 of any suitable or approved construction is mounted in the usual manner beneath the body of the machine and forwardly of the seat 6. 8 indicates the fly wheel of the engine. The engine shaft 9 in the usual con-

struction of such vehicles extends from this fly wheel through the radiator casing and is adapted to have a crank attached to the end thereof by means of which the fly wheel may be manually rotated until it acquires the necessary velocity to cause the operation of the engine.

It is the primary object of my invention to eliminate this undesirable feature of motor vehicle construction and to produce a simple and positively acting device which is adapted to be operated by the chauffeur. To accomplish this end the position of the fly wheel with respect to the engine is reversed, or, in other words, it is positioned on the engine shaft rearwardly of the engine and immediately in advance of the seat 6.

My improved engine operating mechanism is mounted upon a base 10 which is supported upon the chassis of the vehicle in any suitable manner. Journaled bearings 11 are secured to this base and in these bearings the engine shaft 9 is rotatably mounted. A pinion 12 is rigidly secured upon the engine shaft between the bearings 11, collars 13 being disposed upon said shaft on each side of the pinion and secured to the shaft by means of the set screws 14. The pinion 12 would preferably be keyed upon the engine shaft, the collars 13 effectually preventing any longitudinal movement thereof.

A shaft 15 is mounted upon the base 10 in the journal bearings 16, said bearings being arranged adjacent to the bearings 11 which support the engine shaft. Upon this shaft 15 a pinion 17 is slidably mounted. A grooved collar 18 is integrally formed upon one face of the pinion 17. A nut or washer 19 abuts against the other face of the pinion 17. The pinion, collar and nut are locked together by means of a key 20 whereby they are caused to move together upon the shaft. The key 20 is slidably mounted in a longitudinally extending groove 21 formed in the shaft 15. A collar 22 is secured upon the shaft 15 by means of the set screw 23, and between this collar and the nut 19 a coil spring 24 is arranged upon the shaft. This spring is placed under compression in the forward sliding movement of the pinion and is adapted to return the same to its normal position, as shown in Fig. 2, as will be now set forth.

A shaft 25 is mounted for longitudinal sliding movement in a bearing 26 secured to the base 10. The forward end of this shaft is pivotally connected to a foot operated lever 27 which extends through the bottom of the vehicle body and is formed with a knurled head 28 with which the operator's foot engages. The lower end of this lever is pivotally secured between the spaced ears 29. A transversely extending yoke 30 is rigidly secured to the other end of the shaft 25 and has its arms positioned in the peripheral groove of the sliding collar 18. A collar 31 is secured upon the shaft 25 by means of the set screw 32 and limits the forward movement of said rod, whereby the proper meshing engagement of the pinions 17 and 12 is assured.

Upon the rear end of the shaft 15 a beveled pinion 33 is secured. This pinion is engaged with the teeth of a miter gear 34 secured to the end of a transversely positioned shaft 35. This shaft is mounted in suitable bearings 36 and carries the spaced ratchet wheels 37 which are rigidly secured thereto. Each of the ratchets 37 extends between the arms of a yoke member 38 loosely mounted upon the shaft 35. These members each have a gravity pawl 39 arranged between the upper ends of their arms, said pawls being adapted to engage the teeth of the ratchets to alternately lock the yoke members upon the shaft whereby said shaft is rotated. These yoke members are adapted to be oscillated upon the shaft 35 in opposite directions, and are each pivoted at their upper ends to a reciprocating arm 40. The arms 40 are bifurcated to receive the yoke members, the pivot pin securing the gravity pawl in the yoke members also pivotally connecting the members in the bifurcated ends of the arms 40. These arms extend rearwardly and are pivotally connected to the opposite ends of a vertically positioned bar 41. The bar is keyed upon a rotatably mounted shaft 42, said shaft being mounted in the bearings 43 arranged upon the base 10. A collar 44 is secured upon the shaft on opposite sides of the bar by means of the set screws 45, and effectually prevents any sliding movement of said bar. Upon one end of the shaft 42 the operating lever 46 is secured. This lever extends upwardly through the bottom of the machine body and when manipulated by the operator rotates the shaft in its bearings to effect the operation of the engine starting mechanism in the following manner: Upon the pressure of the operator's foot upon the upper end of the lever 27 and the forward movement of this lever, the rod 25 is moved in its bearing and the pinion 17 longitudinally moved upon the shaft 15 to engage its teeth with the teeth of the pinion 12 secured upon the engine shaft, this movement of the gear 17

placing the coil spring 24 under compression. The operator retains his foot upon the lever 27 while he manipulates the operating lever 46. As this lever is moved back and forth, the shaft 42 is oscillated, whereby the arms 40 are caused to reciprocate in opposite directions, and oscillate the yoke members 38 upon the transverse shaft 35. The forwardly moving arm will cause the rotation of the shaft 35 as the gravity pawl 39 carried by one of the yoke members locks this member and the ratchet 37 upon the shaft so that they move together, while the other of the yoke members, being loose upon the shaft, will rotate independently of the other ratchet wheel, said ratchet wheel moving with the transverse shaft 35. Upon the reverse movement of the operating lever 46, the member 38 which was first locked upon the shaft with the ratchet is independently moved thereon while the other of said members is locked whereby the shaft 35 is caused to rotate constantly in the same direction as long as the operating lever is actuated. This rotation of the shaft 35 imparts rotary movement to the shaft 15 through the miter gear 34 and the beveled pinion 33, which in turn rotates the engine shaft and the fly wheel through the intermeshing engagement of the pinions 12 and 17. The proportionate diameters of the pinion 33 and gear 34 may be altered as may be desired in relation to the rapidity of movement of the operating lever. For general use it has been found that a pinion one-third the diameter of the gear will rotate the engine shaft at sufficient velocity to quickly start the engine and it is believed that this proportion will be found to effect the desired results in any of the various makes of motor vehicle engines. After the engine has been started the operator releases his foot from the lever 27, and the spring 24 will immediately throw the pinion 17 out of gear with the pinion 12 thus disconnecting the starting mechanism from the engine shaft.

From the above it is believed that the construction, operation and many novel features of my improved engine starting mechanism will be readily understood. The device is simple, may be easily and quickly operated, and is highly efficient for the purposes in view. The arrangement of the various parts obviates the necessity of the operator leaving his seat, and affords means whereby the great loss of time heretofore consequent upon the constant necessity of restarting the engine after the machine has been stopped, is eliminated. The form of the device shown in the drawings and hereinbefore specifically set forth embodies what I believe to be the most desirable construction and arrangement of parts, but I desire it to be understood that the same is susceptible of various other arrangements and

minor modifications without departing from the essential features or sacrificing any of the advantages of the invention.

Having thus described the invention what is claimed is:

1. The combination with a motor vehicle engine, of engine starting mechanism comprising a shaft transversely positioned with respect to the engine shaft, ratchet wheels rigidly secured on said shaft, a second rotatably mounted shaft, a bar fixed thereon extending upon opposite sides of said shaft, a reciprocating arm pivotally connected to each end of said bar, gravity pawls carried by said arms each movable over the teeth of one of the ratchet wheels, said pawls being alternately locked with their respective ratchet wheels upon the reciprocation of said arms to rotate the first named shaft continuously in one direction, and gearing connecting said transverse shaft and the engine shaft whereby the engine shaft may be rotated.

2. The combination with a motor vehicle engine, of starting means comprising a shaft transversely positioned with respect to the engine shaft, ratchet wheels secured thereon, yoke members loosely mounted on said shaft, said ratchet wheels being disposed between the arms of the respective yoke members, a gravity pawl arranged between the arms of each of said members adapted for alternate locking engagement with the respective ratchet wheel, a second shaft, a bar secured to said shaft extending upon opposite sides thereof, reciprocating arms pivoted to the ends of said bar and to said yoke members, a lever secured to the last named shaft to oscillate the same and reciprocate said arms whereby the yoke members are alternately locked to their respective ratchet wheels, to rotate the first named shaft continuously in one direction, a gear on the end of the first named shaft, a pinion secured on the engine shaft, and manually operable gearing between the transverse shaft and the engine shaft adapted to connect the pinion and gear whereby the engine shaft may be rotated.

3. The combination with a motor vehicle engine, of engine starting mechanism arranged beneath the body of the vehicle, said mechanism comprising a shaft transversely positioned with relation to the engine shaft, ratchet wheels secured thereon, yoke members loosely mounted upon the shaft, said ratchet wheels being positioned between the arms of the yoke members, a gravity pawl carried by each of said members adapted to engage with the teeth of the ratchet wheels to lock said members on the shaft, reciprocating arms pivotally connected to said members, a second rotatably mounted shaft, a bar fixed thereon, said arms being connected to the opposite ends of the bar, an

operating lever secured on one end of said shaft, the rotation of said shaft being adapted to reciprocate the arms in opposite directions and alternately lock the yoke members with the ratchet wheels, whereby said transverse shaft is constantly rotated in one direction, a pinion on the engine shaft, a gear secured on the transverse shaft, and manually operable gearing between said pinion and gear adapted to connect and disconnect the same to rotate said engine shaft.

4. The combination with a motor vehicle engine of starting mechanism arranged beneath the vehicle body and adapted to be operated from the operator's seat, said mechanism comprising a shaft transversely positioned with respect to the engine shaft, means for rotating said shaft constantly in one direction, a beveled gear secured on the end of said shaft, a pinion secured on the engine shaft, a shaft rotatably journaled in bearings and disposed parallel to the engine shaft, a beveled pinion on said shaft engaging with the gear on the transverse shaft, a sliding pinion on the parallel shaft normally out of engagement with the pinion on the engine shaft, means for sliding said pinion into engagement with the pinion on the engine shaft, and means for automatically returning the sliding pinion to its inoperative position.

5. The combination with a motor vehicle engine, of starting mechanism for said engine, said mechanism comprising a rotatable shaft transversely positioned with respect to the engine shaft, manually operated means for rotating said shaft, a pinion secured on the engine shaft, a gear secured on the transverse shaft, a shaft rotatably mounted in parallel relation with the engine shaft, a gear secured thereon meshing with the gear on the transverse shaft, a pinion mounted on the parallel shaft, said pinion having a collar formed thereon, a key carried by said pinion and collar, said shaft having a longitudinal slot to movably receive the key, manually operated means for sliding the pinion on the shaft into engagement with the pinion on said engine shaft, and means for automatically returning the sliding pinion to its inoperative position.

6. The combination with a motor vehicle engine, of operating mechanism for starting the same, said mechanism comprising a rotatably mounted shaft transversely positioned with respect to the engine shaft, means for rotating said shaft, a pinion secured on the engine shaft, a shaft rotatably mounted in parallel relation to the engine shaft, gearing connecting the latter shaft and the transverse shaft for simultaneous rotation, a sliding pinion on said parallel shaft, said pinion having a collar formed thereon, said collar being provided with a

peripheral groove, a coil spring on the shaft
between said pinion and one of the shaft
bearings, a rod slidably mounted adjacent
to said shaft, a collar secured thereon to
5 limit its forward sliding movement, a yoke
secured on one end of said shaft having its
arms disposed in the peripheral groove of
the collar carried by the pinion, a pivoted
foot lever extending through the body of
10 the machine, said rod being pivotally con-
nected thereto at its forward end, the piv-

otal movement of said lever being adapted
to slide the pinion on the shaft into engage-
ment with the pinion on the engine shaft,
whereby said engine shaft may be rotated. 15

In testimony whereof I hereunto affix my
signature in the presence of two witnesses.

PETER P. AU BUCHON.

Witnesses:

C. M. FORREST,
M. C. LYDDANE.