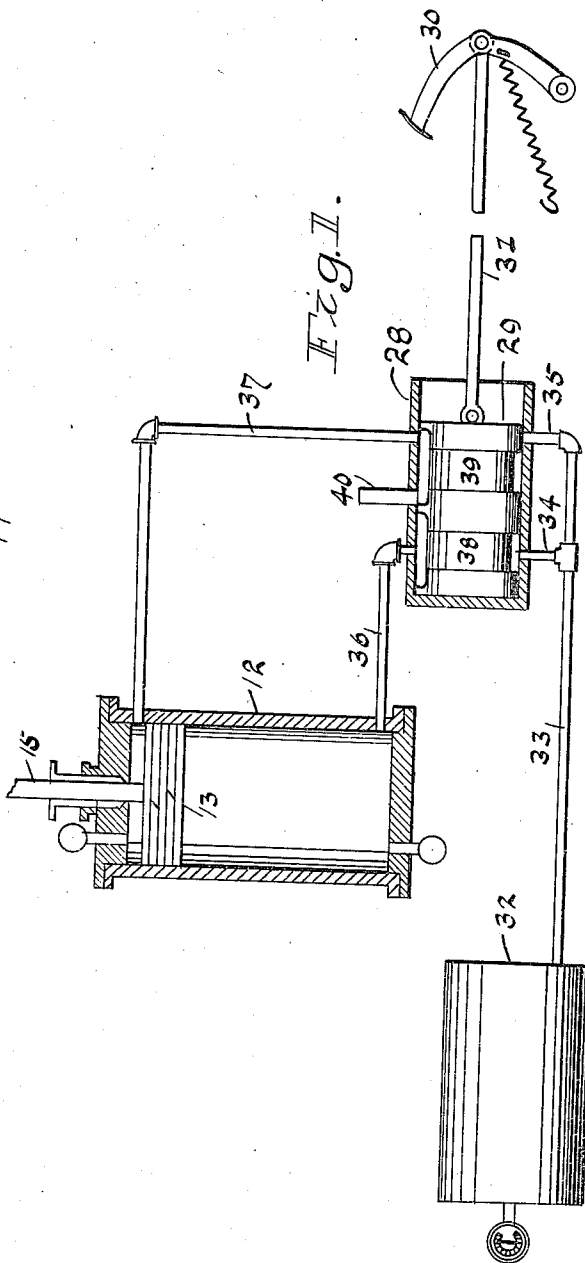
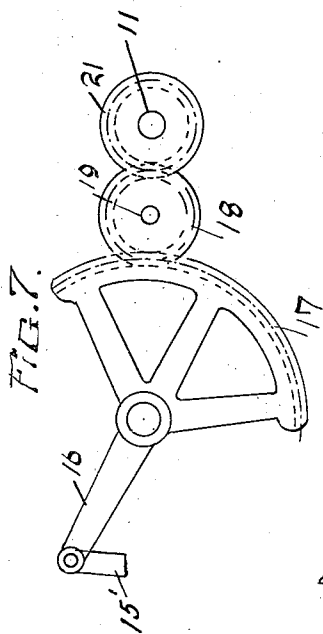


W. H. WITHERS & C. T. HARRIS.
 AUTOMATIC CRANKING DEVICE.
 APPLICATION FILED JUNE 2, 1911.

1,027,957.

Patented May 28, 1912.
 3 SHEETS—SHEET 1.



WITNESSES

W. C. Johnson
N. L. Meem

INVENTORS

William H. Withers
Clifford T. Harris

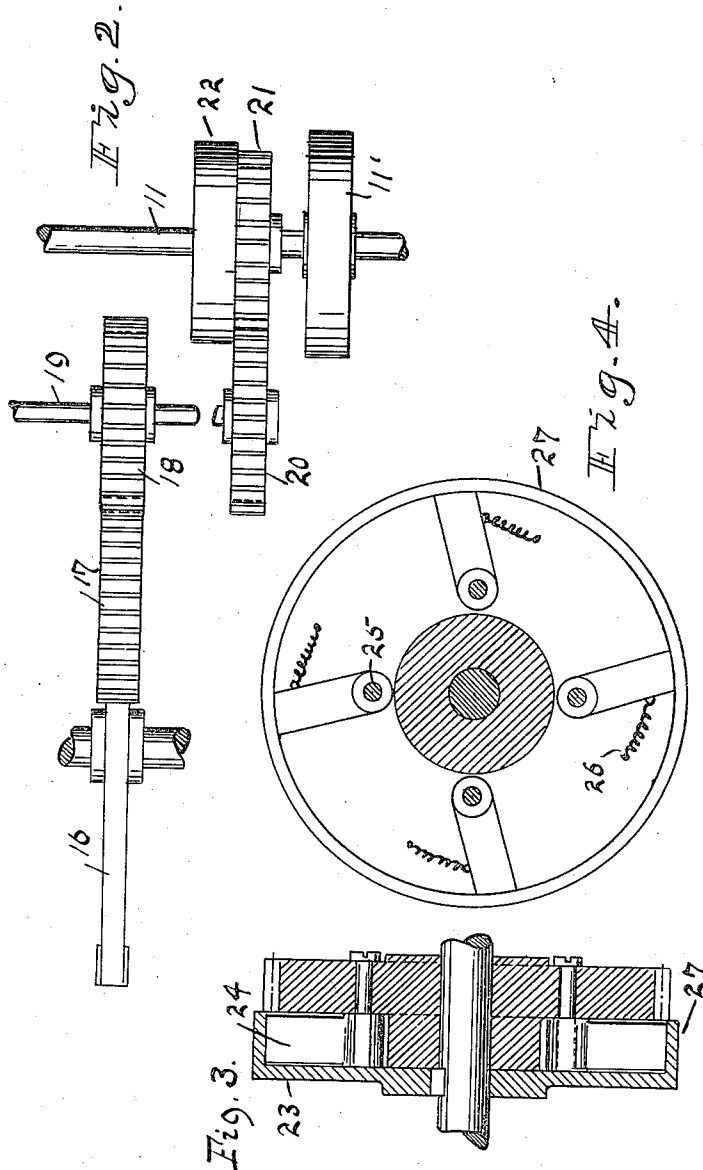
By *Mason, Fennick & Lawrence*
 ATTORNEYS

W. H. WITHERS & C. T. HARRIS.
 AUTOMATIC CRANKING DEVICE.
 APPLICATION FILED JUNE 2, 1911.

1,027,957.

Patented May 28, 1912.

3 SHEETS—SHEET 2.



WITNESSES

W. H. Withers
N. L. Meem

INVENTORS

William H. Withers
Clifford P. Harris

By

Mason, Fenwick & Lawrence
 ATTORNEYS

W. H. WITHERS & C. T. HARRIS.
 AUTOMATIC CRANKING DEVICE.
 APPLICATION FILED JUNE 2, 1911.

1,027,957.

Patented May 28, 1912.

3 SHEETS—SHEET 3.

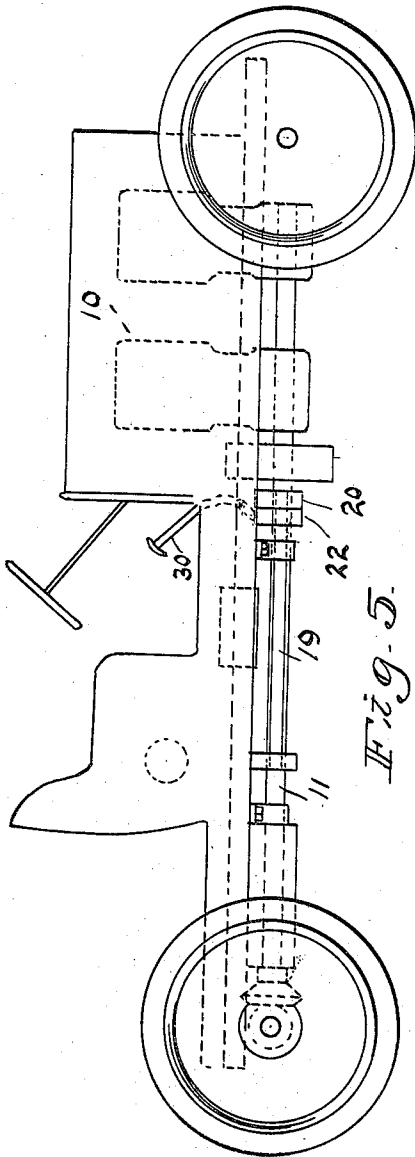


Fig. 5.

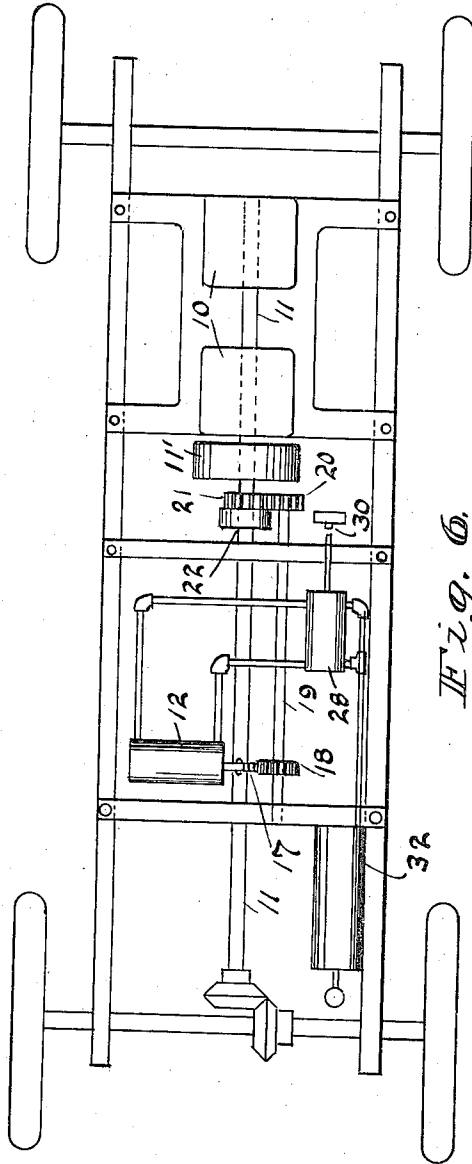


Fig. 6.

WITNESSES

D. B. Simon
N. L. Meem.

INVENTORS
William H. Withers
Clifford T. Harris.
 By *Mason, Fennick & Lawrence*
 ATTORNEYS

UNITED STATES PATENT OFFICE.

WILLIAM H. WITHERS AND CLIFFORD T. HARRIS, OF ATLANTA, GEORGIA.

AUTOMATIC CRANKING DEVICE.

1,027,957.

Specification of Letters Patent.

Patented May 28, 1912.

Application filed June 2, 1911. Serial No. 630,958.

To all whom it may concern:

Be it known that we, WILLIAM H. WITHERS and CLIFFORD T. HARRIS, citizens of the United States, residing at Atlanta, in the county of Fulton and State of Georgia, have invented certain new and useful Improvements in Automatic Cranking Devices; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to automatic cranking mechanism for automobiles and has for an object to provide improved mechanism for utilizing compressed air for turning over the engine or giving the initial start to an internal combustion engine as employed in motor construction.

A further object of the invention is to provide gearing loosely connected with the drive shaft of an internal combustion engine with a piston adapted to actuate a segmental gear and manually controlling means for introducing a fluid under pressure for operating such piston.

With these and other objects in view the invention comprises certain novel constructions, combinations, and arrangement of parts as will be hereinafter more fully described and claimed.

In the drawings: Figure 1, is a diagrammatic view of a portion of the improved cranking mechanism. Fig. 2, is a diagrammatic view showing the connection of the cranking device with the drive shaft. Fig. 3 is a section of the clutch connecting the cranking device with the drive shaft. Fig. 4 is a view in elevation of the clutch with the gear cap removed. Fig. 5 is a view in side elevation of a conventional motor car with our improvements applied thereto. Fig. 6 is a top plan view of the chassis of an automobile with the cranking mechanism applied thereto. Fig. 7 is a diagrammatic view showing a portion of the construction hereinafter described.

In diagrammatic views 1, 2 and 7 the parts do not appear in the same relation as in Fig. 6, in which they are shown in operative position in the machine.

The cranking mechanism forming the subject matter of this application, is adapted for use in connection with an internal combustion engine irrespective of the work to which it is applied and is shown in conjunc-

tion with a conventional automobile simply for the purpose of illustration.

At 10, a conventional internal combustion engine is diagrammatically shown with a drive shaft 11 connected therewith, also a fly wheel 11'. Mounted adjacent the drive shaft is a cylinder 12 having a piston 13 slidable therein and with a piston rod 15 connected by means of a link 15' with a lever 16 which carries a segmental gear 17 meshing with a pinion 18 upon a shaft 19 preferably parallel with and adjacent to the drive shaft 11. The shaft 19 is provided with a gear 20 intergearing with a gear 21 upon the shaft 11 and a clutch is provided, so that shaft 11 is free to rotate independently of shaft 19.

As shown at Figs. 2 and 6 the clutch is shown at 22 upon the shaft 11 but it may be on the shaft 19. In either instance the clutch comprises a casing 23 having detents 24 pivoted therein as at 25 and held by means of springs 26 in contact with the rim 27 of the casing. The casing is rigidly connected with the gear 21 when the clutch is mounted upon the shaft 11 or with the gear 20 when mounted upon the shaft 19. In many instances it is found desirable to mount the clutch upon the shaft 19 for various purposes when the engine is being driven, among which may be mentioned operating an air pump for supplying air for operating the device or for inflating the tires, but such mechanism is only incidental and is not part of the present invention. At any convenient place a cylinder 28 is mounted having a slide valve 29 therein, manually controlled, as by the foot lever 30 and link 31 although such means of controlling the valve is only one of the means which may be employed. Conveniently mounted is also a reservoir 32 which is supplied with fluid under pressure from any convenient source and a pipe 33 connects such reservoir with the cylinder 28, branch pipes 34 and 35 being employed to communicate with such cylinder 28 adjacent opposite ends. Also adjacent such opposite ends the pipes 36 and 37 lead from the cylinder 28 to the opposite ends of the cylinder 12. The slide valve 29 is provided with annular grooves 38 and 39 so positioned as to permit communication for instance between the pipes 34 and the pipe 36 whereby fluid under pressure from the reservoir 32 passed through the cylinder 28 and pipe 36 to one end of the cylinder 12

to actuate the piston 13. The cylinder 28 is also provided with an exhaust port 40 which is positioned to be in communication with the pipe 37 while the pipe 34 is in communication with the cylinder 12, the slide valve 29 acting at the same time to close communication with the pipe 35.

It is apparent that with the parts associated as shown at Fig. 1 fluid under pressure from the reservoir 32 will pass through the cylinder 28 into the cylinder 12 and back to piston 13 thereby actuating the segment 17 and rotating pinion 18 and the shafts 19 and 11. This will give the necessary rotation to the driving shaft to turn the engine over and the air from the opposite ends of the cylinder 12 will be exhausted through the exhaust port 40. When the piston 13 has reached the limit of its movement the reversal of the slide valve 29, by manipulating the foot lever 30, will serve to exhaust the lower ends of the cylinder and admit air to the upper end to return the parts to the position required to begin operation.

We claim:

1. In a device of the class described, the combination of a driving shaft, a gear carried thereby, a cylinder and piston, means connecting the piston with the gear for operating the latter and the driving shaft, a second cylinder, pipes connecting opposite ends thereof with the cylinder first mentioned, inlet pipes for introducing fluid under pressure at the ends of the cylinder at the side opposite the aforesaid means for affording connection with the first cylinder, an exhaust located between the means for connecting the cylinder last mentioned with

the cylinder first mentioned and a valve having annular channels in the outer walls thereof, said channels affording connection between one of the inlet pipes and one of the pipes leading to the cylinder first mentioned and between the other of said pipes connected with the first mentioned cylinder and the exhaust, a pedal, and means connecting the pedal and valve member and movable therewith in the direction of movement of said valve member.

2. In an engine starting device, a driving shaft, a gear carried thereby, a second shaft substantially parallel with the shaft first mentioned, a gear on the second shaft meshing with the gear first mentioned, a clutch on one of said shafts and permitting the independent rotation of the shafts, a cylinder substantially perpendicular to the second shaft, and intermediate of the ends thereof a piston within the cylinder, a piston rod, a segment connected therewith, a third gear mounted on the second shaft and arranged to mesh with the segment, a valve and valve casing, the latter having connection with the interior of the cylinder, a pedal, a rod connected with the pedal and valve and movable in the same direction as the valve, and means for supplying fluid to the valve casing.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM H. WITHERS.
CLIFFORD T. HARRIS.

Witnesses:

M. EVANS,
THOMAS L. BISHOP.