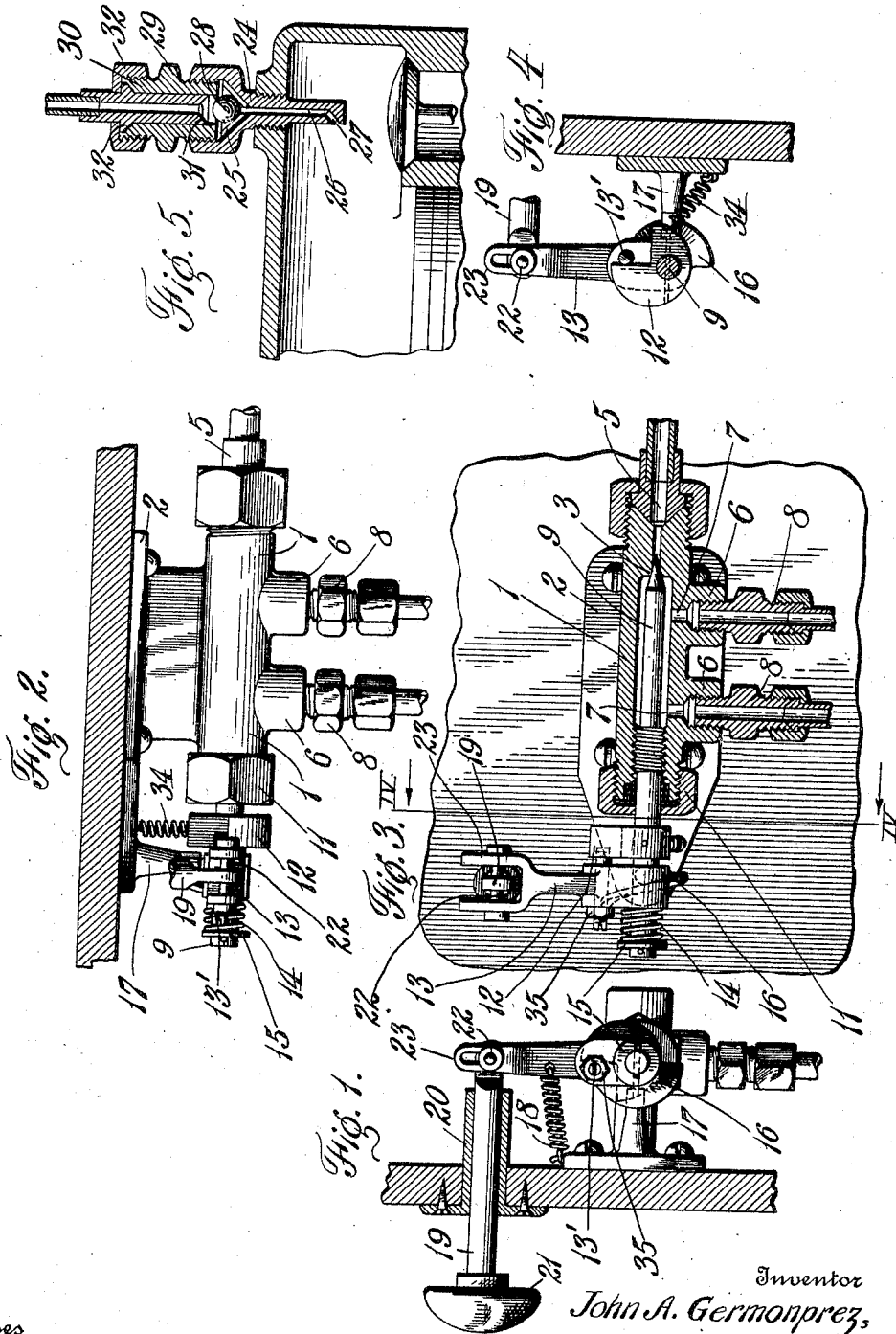


J. A. GERMONPREZ.
ENGINE STARTER.
APPLICATION FILED DEC. 15, 1911.

1,039,118.

Patented Sept. 24, 1912.



Witnesses
Chas. W. Stauffer
A. M. Dore.

Inventor
John A. Germonprez,
By *[Signature]*
Attorney

UNITED STATES PATENT OFFICE.

JOHN A. GERMONPREZ, OF DETROIT, MICHIGAN, ASSIGNOR OF ONE-THIRD TO JOHN L. SCHNEIDER AND ONE-THIRD TO WILLIAM J. WIRTS, BOTH OF DETROIT, MICHIGAN.

ENGINE-STARTER.

1,039,118.

Specification of Letters Patent.

Patented Sept. 24, 1912.

Application filed December 15, 1911. Serial No. 665,998.

To all whom it may concern:

Be it known that I, JOHN A. GERMONPREZ, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Engine-Starters, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to starters for explosive engines of the type adapted to inject fuel charges into the cylinder, the object being to provide means for forcing the exact amount required into each cylinder without attention on the part of the operator, and means for regulating or varying the amount discharged to suit different motors.

15 The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

20 In the drawings, Figure 1 is a view in end elevation of a device embodying features of the invention showing a dash-board on which it is mounted in section; Fig. 2 is a plan view of the device with the operating lever broken away; Fig. 3 is a view partially in elevation and partially in vertical section of the device; Fig. 4 is a view in section on line IV—IV of Fig. 3; and Fig. 5 is a view in section and detail showing a check valve connection with a motor cylinder.

25 As herein shown a casing 1 with a substantially cylindrical body is mounted on a suitable base 2 for attachment to the side of the dash-board. A valve seat 3 at one end of the bore of the casing forms the mouth of a supply tube 5 adapted to be connected by suitable exterior fittings and pipes with a source of fuel supply. A plurality of lateral bosses 6, corresponding in number to the cylinders of the engine for which the starter is intended, have outlet passages 7 in communication with the bore of the casing and are provided with suitable pipe fittings 8 in connection with tubes which lead to cylinder inlet nipples.

30 A needle closure 9 for the seat 3 has a screwthreaded stem in engagement with the end of the casing 1 through which it extends, a packing gland 11 of conventional type forming a close joint around it. A trip plate 12 with a shoulder or face sub-

stantially radial to the stem is secured on the outer portion thereof. A rock arm 13 is journaled on the stem and has a stop trip pin 13' adjustable transversely thereto in substantially parallel relation to the stem 9. The parts are so disposed that a coiled spring 14 in compression around the stem between a stop collar 15 thereon and the adjacent face of the rock arm 12 projects the pin 13' across the radial face of the plate 12 when the parts are in initial or normal position. An oblique or helically disposed segmental flange 16 on the rock arm bears against a projection 17 on the base 2 of the casing so that turning of the arm outwardly against the action of a suitably disposed spring 18 causes the rock arm to travel toward the stop collar 15 against the spring 14. A push rod 19 in a suitable bushing 20 in the support is provided with a pedal 21 and is pivoted at its inner end by a pin 22 to slotted fingers 23 of the rock arm 12. The connection between the push rod 19 and the rock arm fingers is such as to allow free movement of the rock arm longitudinally of the needle valve stem.

Each of the pipes that lead from one of the nipples 6 is connected to a fitting adapted to be inserted in the cylinder head over the valve in place of the usual priming cup. As herein shown this fitting consists of a screwthreaded plug 24 having an enlarged upper end with tapered and grooved valve seat 25. A duct 26 leads from the base of the valve seat into an oblique outlet 27 arranged to direct flow from the plug over the piston head, as shown for example, in Fig. 5. A check ball 28 lying on this grooved seat is retained in a screwthreaded member 29 by an inner tube 30 having an annular valve seat 31 at its lower end adapted to be closed by the ball against back pressure in the cylinder. As a convenient means of obtaining a tight joint, a beveled collar 32 on the tube 30 is seated in the correspondingly faced end of the member 29 by a cap 33 to which the end of the supply tube is suitably secured.

100 In operation endwise movement of the push rod by pressure on the pedal throws the rock arm over, and by engagement of the rock arm pin with the trip plate, turns the

closure stem and thereby carries it away from its valve seat. This admits a charge into the interior of the casing. Before the rock arm has reached the end of this stroke the cam flange thereon has moved it so that the pin releases the trip plate and the latter falls back under the influence of a suitably disposed spring 34. As a consequence of this arrangement, the charge admitted is dependent entirely upon the length of time of engagement of the rock arm pin with the trip plate, and as the pin is adjustable in the trip plate, as by means of a check nut 35 or the like, the charge may be accurately gaged to meet different requirements of service. Thus the device is applicable for use with motors of any type or size.

Obviously, changes in the details of construction may be made without departing from the spirit of the invention and I do not care to limit myself to any particular form or arrangement of parts.

I claim:—

1. The combination with a motor having explosion chambers, of a casing having outlets each connected to one of the chambers and a fuel inlet common to all the outlets, a self-seating closure for the inlet, and means for moving the closure to open the inlet, adjustable to release the closure when the latter has moved any predetermined extent.

2. The combination with a motor having explosion chambers, of a casing having outlets each connected to one of the chambers and a fuel inlet common to all the outlets, a self-seating closure to open the inlet, means for moving the closure to open the inlet, and operating connections between the closure and means, adapted to release the closure to seat itself when the latter has moved to a predetermined point.

3. The combination with a motor having explosion chambers, of a casing having outlets each connected to one of the chambers and a fuel inlet common to all the outlets, a self-seating closure for the inlet, means for moving the closure to open the inlet, and operating connections between the closure and means, adjustable to release the closure to seat itself when the latter has moved to any predetermined extent.

4. The combination with a motor having explosion chambers, of a casing having outlets each connected to one of the chambers and a fuel inlet common to all the outlets, a self-seating closure for the inlet, a reciprocable member adapted to engage and move the closure to open the inlet when the member is shifted in one direction, and to release the closure during the same movement when the closure moves a predetermined extent.

5. The combination with a motor having explosion chambers of a casing having outlets each connected to one of the chambers

and a fuel inlet common to all the outlets, a self-seating closure for the inlet, a reciprocable member for moving the closure to open the inlet, and operating connections between the member and closure adapted to engage the latter when the closure is moved in one direction only and to release the closure to seat itself when the closure has moved a predetermined extent.

6. The combination with a motor having explosion chambers, of a casing having outlets each connected to one of the chambers, and an inlet, an automatically closing valve for the inlet and means adapted to open the valve and to release the valve to close itself when the latter has moved to a predetermined position.

7. The combination with a motor having explosion chambers, of a casing having outlets each connected to one of the chambers and an inlet, a valve closure for the inlet, spring operated means for holding the closure seated, and means for positively opening the closure, arranged to release the latter to the action of the spring operated means when the closure has been moved a predetermined extent.

8. The combination with a motor having explosion chambers, of a casing having outlets each connected to one of the chambers and an inlet common to the outlets, a valve closure for the inlet adapted to be moved by rotation to open the inlet, a reciprocable member, means operatively connecting the closure and member to turn the former when the latter is shifted in one direction and to release the latter when it has turned to a predetermined point, and means for automatically returning the closure to initial closed position when released.

9. The combination with a motor, having explosion chambers, of a casing having outlets each connected to one of the chambers and an inlet common to the outlets, a needle valve closure screwthreaded into the casing for closing the inlet, a trip plate on the closure stem, a rock arm rotatable and reciprocable longitudinally on the closure stem, a stop adjustably secured on the arm adapted to engage the trip plate when the parts are in initial position, a spring normally projecting the rock arm toward the trip plate, and a cam engaging the casing and positively shifting the arm to release the trip.

10. The combination with a motor having explosion chambers, of a casing having outlets each connected to one of the chambers and an inlet common to the outlets, a needle valve controlling the inlet having a stem in screwthreaded engagement with the casing, a trip plate secured on the closure stem, a rock arm rotatable and reciprocable longitudinally on the stem, a spring adapted

to normally project the rock arm toward the trip plate, an adjustable stop on the rock arm adapted to engage the trip plate to turn with the arm when the latter is projected toward the plate, a cam on the arm adapted to retract the latter to move the stop out of engagement with the trip plate when the arm is rocked, a spring adapted to return the stem to closed position, and a member for moving the rock arm. 10

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

JOHN A. GERMONPREZ.

Witnesses:

OTTO F. BARTHEL,
A. M. SHANNON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."