

G. A. ARNOLD.
LOCKING VALVE OPERATING DEVICE.
APPLICATION FILED MAY 4, 1914.

1,150,162.

Patented Aug, 17, 1915.

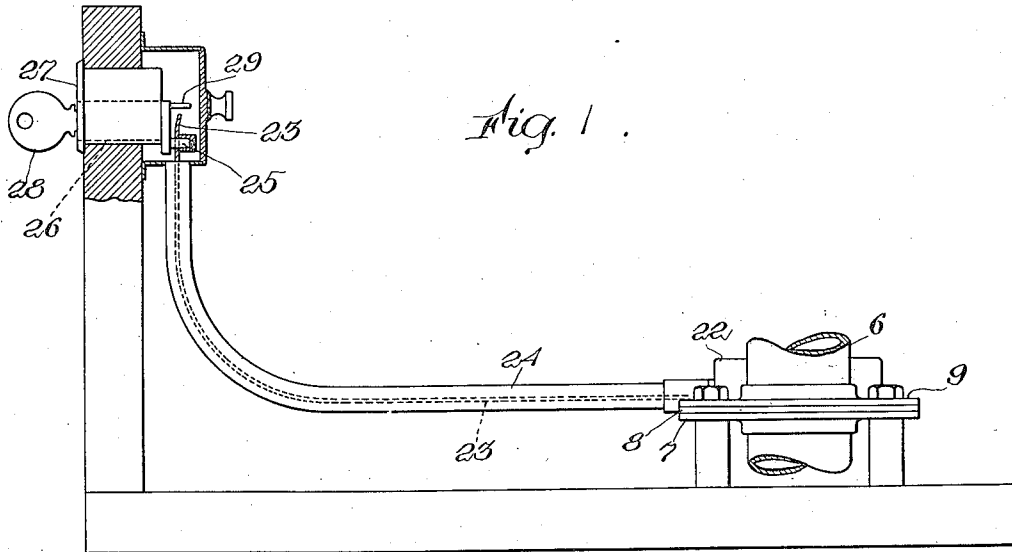


Fig. 1.

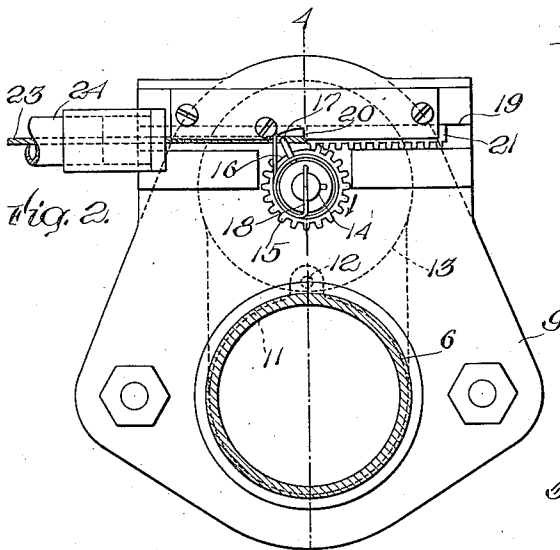


Fig. 2.

Fig. 3.

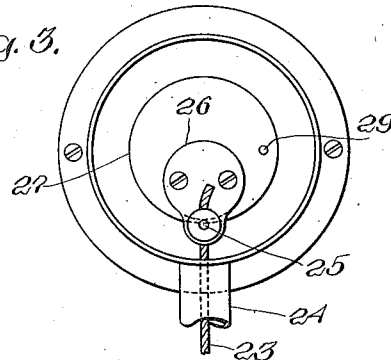


Fig. 5.

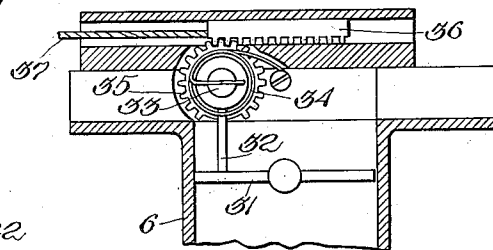
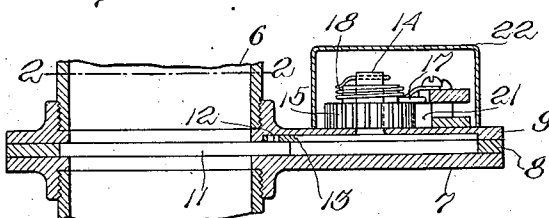


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE A. ARNOLD, OF MIDDLETOWN, CONNECTICUT, ASSIGNOR TO ARNOLD ELECTRIC COMPANY, A CORPORATION OF MASSACHUSETTS.

LOCKING-VALVE-OPERATING DEVICE.

1,150,162.

Specification of Letters Patent.

Patented Aug. 17, 1915.

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To all whom it may concern:

Be it known that I, GEORGE A. ARNOLD, a citizen of the United States, residing at Middletown, in the county of Middlesex and State of Connecticut, have invented certain new and useful Improvements in Locking-Valve-Operating Devices, of which the following is a specification, reference being had to the accompanying drawings, forming part thereof.

This invention has reference to improvements in valve actuating or operating devices particularly adapted for use in operating the valves of supply pipes of combustion engines.

One object of this invention is to so construct a valve operating and locking device for the fuel supply pipes of combustion engines that attempted unauthorized operation of the valve will effect disconnection between the valve and its operating mechanism.

Another object of the invention is to so construct a valve operating mechanism having a limited degree of operating movement and having a pair of cooperating members that said members may disengage at the limits of movement of one of said members, and to provide said operating mechanism with an actuating device having a definite degree of action.

Other objects of the invention will appear from the following description.

The invention consists in the novel construction of the valve operating mechanism.

The invention also consists in such other novel features of construction and combination of parts as shall hereinafter be more fully described and pointed out in the claims.

Figure 1, represents a side elevation of the improved valve operating mechanism parts of the same being shown in section, the mechanism being, for convenience of illustration, shown as mounted on a base which base does not form part of the invention. Fig. 2, represents an enlarged plan sectional view of the valve case and valve operating mechanism as taken on line 2—2 Fig. 4, the cover of the operating mechanism being removed. Fig. 3, represents an enlarged view of the actuating means for the valve operating mechanism. Fig. 4, represents a sectional view taken on line 4—4 Fig. 3. Fig. 5, represents a sectional view

of a supply pipe illustrating a modified construction of the invention.

Similar characters of reference designate corresponding parts throughout.

As shown in the drawings in its preferred form 6 represents a portion of any pipe particularly the fluid supply pipe adapted to communicate with the fuel manifold supply of a combustion engine. Intersecting said supply pipe 6 is a valve casing or chamber having the members 7, 8 and 9 and in said member 8 is the guide 10 in which is slidable the valve 11 having the pin 12 which is engaged with a bearing near the periphery of the disk 13 rotatable in a recess of member 9 and having the stud 14 which is journaled in a bearing of said member 9 and having, above said member 9, the pinion 15 which is mutilated as to its teeth for a portion of its periphery 16 and has the pin 17. Spring 18 is engaged with said shaft and has one end secured to a fixed part of the mechanism and said spring acts constantly to effect the rotation of stud 14 to rotate said stud and its disk or lever member 13 in a direction to move the valve 11 to close pipe 6 that is stud 14 and its pinion 15 tend constantly to rotate in the direction indicated by the arrow in Fig. 2.

Mounted on valve casing member 9 is the guide 19 having the stop 20 which is positioned to intercept pin 17 when pinion 15 rotates sufficiently in the direction indicated by the arrow of said pinion 15 and before said pinion, its stud 14 and the disk 13 rotate sufficiently to retract valve 11 from its closed position. In the guide 19 is slidable the rack 21 having a series of teeth which in number do not exceed the number of teeth of pinion 15 so that excessive movement of rack 21 in either direction will result in its disengagement from pinion 15 whereupon spring 18 effects the rotative movement of stud 14 and pinion 15 until pin 17 is intercepted by stop 20.

The valve operating mechanism including rack 21 and pinion 15 are preferably protected by cover 22 and, as this mechanism is usually located in a position not readily accessible the rack 21 is provided with the cable 23 which extends through the tube 24 to some convenient position at which said cable 23 may be operated to move rack 21 in one direction, that is in the direction to effect the opening movement of valve 11.

Owing to the disengagement of rack 21 from pinion 15 by the undue movement of said rack it is evident that only a predetermined movement of cable 23 should be made and the means for accomplishing such movement of cable 23 should be locked against unauthorized operation. This operation of the cable 23 is accomplished in its preferred form by attaching one end of said cable to the pin 25 of a crank of which the journaled member 26 is the barrel of a locking device 27 and is adapted to be rotated by the usual key 28 while the degree of rotation of member 26 is limited by the stop 29 which is in fixed position to intercept crank pin 25. When cable 23 is drawn taut and secured to crank pin 25 and the barrel 26 is given a partial rotation by means of key 28 it is evident that the drawing action of cable 23 will equal the distance of throw of said crank pin and such distance of movement is sufficient to move rack 21 to cause the valve opening rotative movement of pinion 15 and its related parts. The crank of which pin 25 is a member and the end of cable 23 is protected from unauthorized operation by the casing 30 or by some similar casing.

If tube 24 is in position to be reached and access to cable 23 is sought by cutting said tube the probability is that said cable will also be cut and, in that case, spring 18 will act to rotate pinion 15 until its pin 17 is arrested by stop 20 and clearance 16 of said pinion will be positioned relative to the teeth of rack 21 so that said rack in its movement cannot engage with the teeth of said pinion 15 and, hence, said pinion cannot be operated to effect the opening movement of valve 11. On the other hand, if tube 24 is cut away sufficiently to secure a grasp on cable 23, by the hand or by an instrument, the unauthorized operator is without knowledge as to the distance to draw said cable 23 to effect the opening of valve 11, a probability being that such operator will draw said cable and rack 21 until the teeth of said rack become disengaged from pinion 15 with the result that said pinion will then be reversely rotated by spring 18, in the valve closing direction, until pin 17 of said pinion is arrested by stop 20.

In the modification disclosed in Fig. 5 the pipe 6 is shown as provided with the

butterfly valve 31 which is held in the closed position by the arm 32 of the rotatable shaft 33 having the actuating spring 34 and the mutilated pinion 35, similar to pinion 15 and operated in one direction by the slidable rack 36 attached to the drawing cable 37 which latter is similar to cable 23 and is adapted to be similarly operated.

It is not my intention to limit this invention to the specific features of construction herein shown and described as I understand that the construction and arrangement of the parts herein shown may be modified without departing from the spirit of my invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent.

1. Valve operating means comprising a slidable valve, a rotatable member in connection with said valve and having a mutilated pinion, a spring acting to operate said member in the valve closing direction, a rack slidably mounted and normally engaged with said pinion, and means for operating said rack.

2. Valve operating means comprising a valve, an actuating member therefor having a pinion, a spring acting to move the actuating member in the valve closing direction, a rack normally engaged with the pinion, a cable attached to the rack and arranged to disengage the same from the pinion upon being severed at any point in its length, and a lock having a rotatable barrel provided with a crank to which the cable is attached.

3. Valve operating mechanism comprising a valve, an actuating member therefor provided with a shaft, a mutilated pinion mounted upon the shaft and having a radially extending pin, a spring acting to rotate the shaft in the valve closing direction, a stop for interrupting the pin, a slidable rack engaged with the pin, a cable connected with the rack, a rotatable cable drawing member connected with the cable, and operating when severed at any portion of its length to cause the valve actuating member to close the valve, and means for locking the rotatable member.

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