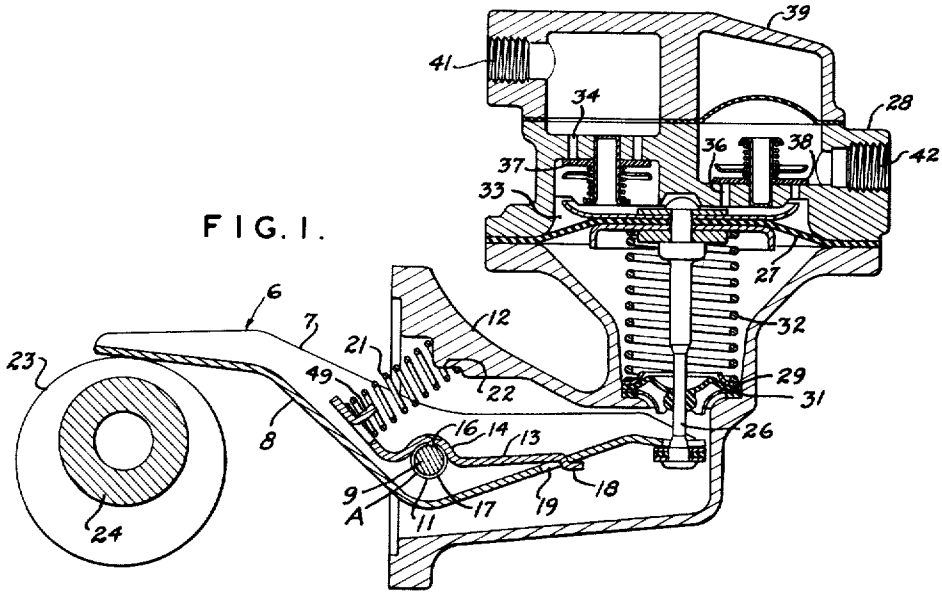
Jan. 5, 1960 A. C. KORTE 2,919,654

FUEL PUMP LEVER STABILIZER

Filed Jan. 15, 1957

FIG. 1.



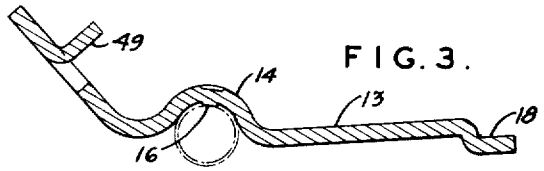


FIG. 3.

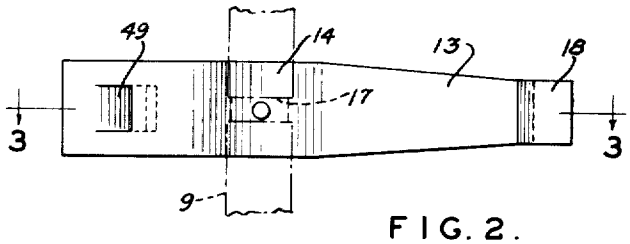


FIG. 2.

INVENTOR.
ALFRED C. KORTE
BY Bertram H. Mann

ATTORNEY

United States Patent Office 2,919,654 Patented Jan. 5, 1960

2,919,654

FUEL PUMP LEVER STABILIZER

Alfred C. Korte, St. Louis, Mo., assignor to ACF Industries, Incorporated, New York, N.Y., a corporation of New Jersey

Application January 15, 1957, Serial No. 634,249

6 Claims. (Cl. 103—215)

This invention relates to diaphragm type, engine driven pumps for automobiles and more particularly to a fuel pump having a rocker arm mounted intermediate its ends on a pivot pin and actuated by a cam on the engine camshaft.

During use of pumps of this type, the pivot pin and the pin receiving bearings in the rocker arm become worn and cause a clicking noise which, in some types of engines, is amplified and thereby becomes annoying and objectionable.

It is, therefore, an object of the invention to provide a pump structure in which pivotal movement of the rocker arm does not cause any noise when the pivot pin and pin receiving bearings become worn in service.

Another object of the invention resides in the provision of a pump structure embodying means for preventing movement of the rocker arm transversely of the pivot pin during operation of the pump.

A further object is to provide a lever coacting with a rocker arm return spring to urge the rocker arm transversely of the pivot pin to eliminate noise due to wear and radial movement between the pin and the pin receiving bearings in the rocker arm.

The invention embodies other novel features, details of construction, and arrangement of parts which are hereinafter set forth in the specification and claims and illustrated in the accompanying drawings, wherein:

Fig. 1 is a vertical sectional view illustrating a pump embodying features of the invention.

Fig. 2 is an enlarged detail plan view illustrating a rocker arm return lever.

Fig. 3 is a sectional view taken along the line 3—3 of Fig. 2.

Referring now to the drawing for a better understanding of the invention, the pump is shown as comprising a rocker arm 6 of generally channel section having side flanges 7, only one of which is shown interconnected by a web 8. The rocker arm is pivotally mounted intermediate its ends on a pivot pin 9 which extends through coaxial bearing apertures 11 in the side flanges 7 and is securely mounted at its ends in a housing 12.

A lever 13 is formed intermediate its ends with an arcuate bearing portion 14 for pivotal movement on the pin 9, and a boss or protuberance 16 is formed in the arcuate bearing portion to project into an annular groove 17 formed on the pin to prevent movement of the lever axially of the pin. The inner end of the lever 13 is offset at 18 to extend through a slot 19 in the web 8 and engage the underside thereof, the width of the slot being slightly greater than the width of the offset end 18 of the lever. The outer end of the lever is provided with a lug 49 to receive and engage one end of a helical compression spring 21 having its other end seated at 22 on the housing 12. The spring 21 acts through the lever to urge the outer end of the rocker arm against a cam 23 on an engine camshaft 24.

The inner end of the rocker arm 6 is bifurcated to receive one end of a pull rod 26 secured to a flexible

diaphragm 27 having its marginal portion clamped between the housing 12 and a valve casing 28. A flexible seal 29, formed with a central aperture to snugly receive the pull rod, is engaged at its periphery against an annular seat 31 in the housing 12 by means of a compression spring 32 provided to engage the diaphragm.

The diaphragm 27 and casing 28 define a pump chamber 33 having inlet ports 34 and outlet ports 36 provided with spring-pressed inlet and outlet check valves 37 and 38, respectively. A cover 39 is bolted to the casing 28 and provided with an inlet 41 for the passage of fuel from a fuel tank through the inlet ports 34 into the pump chamber 33 and thence through the outlet ports 36 through an outlet 42 to a carburetor.

In the operation of the pump to supply fuel from a tank to a carburetor, the rotating cam 23 acts through the rocker arm 6, pull rod 26, and diaphragm 27 to draw fuel through the inlet ports 34 into the pump chamber 33, after which the compression spring 32 acts against the diaphragm to force the fuel from the chamber 33 through the outlet ports 36.

During the spring discharge stroke of the pump, the compression spring 21 acts through the lever 13 to urge and maintain the outer end of the rocker arm 6 against the cam 23.

During the intake stroke of the pump, it will be noted that the cam 23 acts to force the rocker arm bearing portions upwardly against the lower side "A" of the pivot pin 9. During the discharge stroke of the pump, the compression spring 21 acts through the lever 13 and coacts with the cam to urge and maintain the rocker arm bearing portions against the lower side "A" of the pivot pin 9.

By providing a lever to engage the rocker arm 6, pin 9, and return spring 21, the rocker arm is restrained from movements transversely of the pin during operation of the pump, thereby eliminating noises heretofore resulting from such movements.

The invention may be modified as will occur to those skilled in the art and the exclusive use of all modifications as come within the scope of the appended claims is contemplated.

I claim:

1. An actuating mechanism for a cam operated mechanical fuel pump comprising a housing, a reciprocably movable rocker arm one end of which is in operative engagement with said pump, the opposite end of the arm acting as a follower for said cam, a pin mounted in the housing and having one side which acts as a fulcrum for the arm as it is actuated by the cam in one direction, a biasing spring for returning the rocker arm in the opposite direction, and an intermediate lever also carried upon the pin, one end of which is engaged by the spring, the opposite end of the lever articulately connecting with the rocker arm between its pump engagement end and the pin so that as the arm is returned by the biasing spring the arm bears against the fulcrum side of the spring.

2. An actuating mechanism for a cam operated mechanical fuel pump comprising a housing, a reciprocably movable rocker arm one end of which is in operative engagement with said pump, the opposite end of the arm acting as a follower for said cam, a pivot pin mounted in the housing and having one side which acts as a fulcrum for the rocker arm as it is actuated by the cam in one direction, a yieldable compression spring for returning the rocker arm in the opposite direction, and an intermediate lever also carried upon the pin, a raised boss on one end of said intermediate lever which is engaged by the compression spring, the opposite end of the intermediate lever articulately connecting with the rocker arm between its pump engagement end and the pin so that

as the arm is returned by the biasing spring the arm bears against the fulcrum side of the spring.

3. An actuating mechanism for a cam operated mechanical fuel pump comprising a housing, a reciprocably movable rocker arm having a recess therein adjacent one end of said rocker arm which is in operative engagement with said pump, the opposite end of the arm acting as a follower for said cam, a pivot pin mounted in the housing and having one side which acts as a fulcrum for the arm as it is actuated by the cam in one direction, a biasing spring mounted in said housing for returning the rocker arm in the opposite direction, and an intermediate lever also carried upon the pin, one end of which is engaged by the spring, the opposite end of the lever extending through said recess and articulately connecting said lever with the rocker arm between its pump engagement end and the pin so that as the arm is returned by the biasing spring the arm bears against the fulcrum side of the spring.

4. An actuating mechanism for a cam operated mechanical fuel pump comprising a housing; a reciprocably movable rocker arm having a recess therein adjacent one end of said rocker arm which is in operative engagement with said pump, the opposite end of the arm acting as a follower for said cam, a pivot pin mounted in the housing and having one side which acts as a fulcrum for the arm as it is actuated by the cam in one direction, a yieldable compression spring for returning the rocker arm in the opposite direction, and an intermediate lever also carried upon said pivot pin, one end of which is engaged by the spring, the opposite end of the lever extending through said recess and articulately connecting said lever with the rocker arm between its pump engagement end and the pin so that as the arm is returned by the biasing spring the arms bears against the fulcrum side of the spring.

5. An actuating mechanism for a cam operated mechanical fuel pump including a housing and a pumping member, a reciprocably movable rocker arm in said housing having one end operatively engaging said pumping member to actuate the same in one direction, a compression spring for actuating said pumping member in

the other direction, the opposite end of said rocker arm acting as a follower for said cam, a pivot pin mounted in the housing, said pin having an underside portion in engagement with said rocker arm and acting as a fulcrum for said arm as it is actuated by the cam in one direction, a lever having one end articulately connected with said rocker arm, said lever normally engaging an upper side portion of said pin which provides a fulcrum therefor, and a biasing spring in the housing and engaging the other end of the lever to move said lever on its fulcrum in a direction for urging said rocker arm into contact with said pin when the pumping member is actuated by said compression spring.

6. An actuating mechanism for a cam operated mechanical fuel pump, comprising a housing, a reciprocably movable rocker arm, said rocker arm having one end in operative engagement with said pump and its opposite end acting as a follower for said cam, a pin mounted in the housing, said pin having a side which acts as a fulcrum for the rocker arm as it is actuated by the cam in one direction, a lever, said lever having a portion fulcrumed on the opposite side of said pin, the inner end of said lever being articulately connected with the rocker arm between its area of engagement with the pump and its area of engagement with the pin, and a biasing spring mounted between the casing and the outer end of said lever, whereby said lever is biased against said pin in one direction and the rocker arm is biased against said pin in the opposite direction.

References Cited in the file of this patent

UNITED STATES PATENTS

1,891,902	Babitch	Dec. 27, 1932
1,905,246	Schweisthal	Apr. 25, 1933
1,984,198	Notter	Dec. 11, 1934
2,094,019	Notter	Sept. 28, 1937
2,507,339	Katcher	May 9, 1950
2,567,055	Coffey	Sept. 4, 1951
2,634,687	Smith	Apr. 14, 1953
2,654,266	Edelen	Oct. 6, 1953