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LINKAGE FOR FUEL PUMPS

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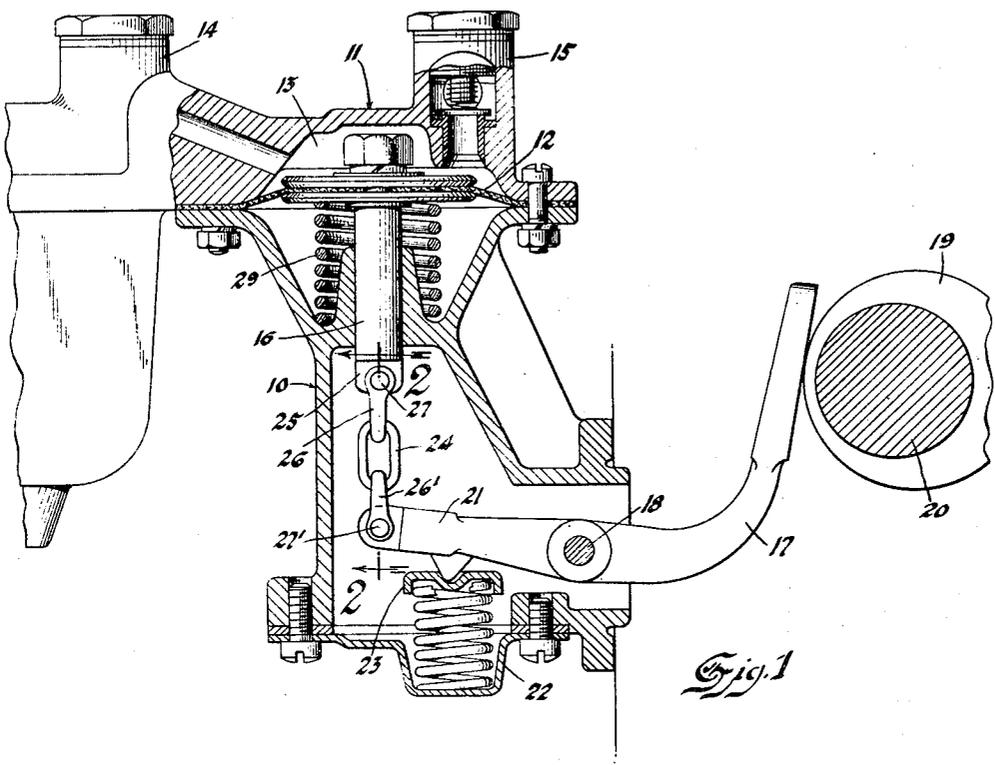


Fig. 1

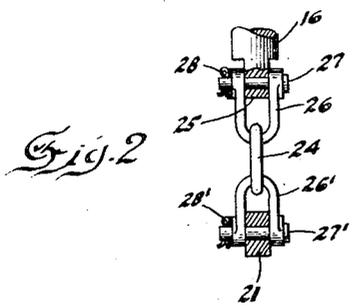


Fig. 2

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LINKAGE FOR FUEL PUMPS

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Although this invention is referred to as a fuel pump, it relates more particularly to a specific and quietly operating thrust-refusing connection between a reciprocated actuating element and a diaphragm stem or equivalent element attached to a pump diaphragm or other reciprocating pumping element adapted to receive a variable stroke,—said stroke being diminished in response to pressure within a pump chamber.

Although the principles of this invention are believed to be applicable to various types of fuel pumps, or the like, the illustrated pump is of the same general type as that described and claimed in a pending application of Abraham M. Babitch, Serial 123,370, filed July 19, 1926; but the present invention may be regarded as relating particularly to the use of a flexible element comprising substantially inflexible open links, such as the links of an ordinary chain, terminal links being preferably of a special form hereinafter described, in connecting the mentioned actuating element with a diaphragm stem or other handling element attached to a reciprocating pumping element.

Other objects of this invention may be best appreciated from the following description of specific embodiments thereof, taken in connection with the appended claims and the accompanying drawings.

Fig. 1 is, for the most part, a substantially median vertical section.

Fig. 2 is a sectional detail view, taken as indicated by the line 2—2 of Fig. 1.

Referring first to Fig. 1, 10 and 11 are respectively a body casting and a cover casting, a reciprocating pumping element in the form of a diaphragm 12 being shown as secured therebetween, and as adapted to vary the volume of a pump chamber 13, provided with an inlet valve 14 and with an outlet valve 15. The diaphragm 12 is adapted to receive an intake stroke through an attached handling element in the form of a slidable rod or stem 16; an actuating element in the form of a lever 17 is shown as pivoted at 18 and as adapted to be continuously engaged by a reciprocating or rotating driven element such as a cam 19 upon a shaft 20; and an inner end 21 of said lever

may be provided with means, such as a compression spring retained between cupped plates 22 and 23, tending constantly to press said lever against the cam 19, or its equivalent.

Coming now to the novel features or new combinations to whose protection the present application is directed, an open link 24 is shown as secured to a reduced end 25 of the diaphragm stem 16 and to a reduced portion of the end 21 of lever 17 by means of U-shaped open links 26, 26' and pivot pins 27, 27',—shown as retained by cotters 28, 28'.

Using this construction, and assuming the link 24 to be substantially inelastic and inextensible, and whether or not the respective links of a flexible connecting element of the described character remain always in mutual contact (the chain formed thereby merely sagging between the pivot pins 27, 27' in a manner which substantially obviates contact noises during reciprocation of the lever 17 when the diaphragm 12 is held down by a pressure built up in the pump chamber 13) it will be seen that the intermediate means here described is incapable of transmitting a thrust from the lever 17, shown as having a uniform throw, to the diaphragm stem, or its equivalent; but it should be understood that, instead of a single complete elliptical link between U-shaped links, any desired plurality of intermediate links, either in parallel relationship or in series, may be interposed in the general manner described; and that "the lost motion" provided by the indicated use of open links renders the length of stroke produced by a rocking of the lever 17, or its equivalent, not only substantially noiseless but dependent upon the pressure built up within the pump chamber 13 by means such as a compression spring 29, serving to effect the expulsion strokes of the diaphragm 12.

Although but a single form of this invention is herein shown, it will be obvious that numerous modifications thereof might easily be devised, all within the spirit and scope of this invention as the same is indicated above and in the following claims.

I claim:

1. A pressure-responsive pump organization including: a reciprocable pump element

having resilient means to effect expulsion strokes thereof and also an attached handle element; an actuating element having a uniform throw; and a thrust-refusing motion-transmitting means in the form of substantially inflexible open links adapted to so sag as substantially to obviate contact noises between said actuating element and said attached element to impart variable strokes to the latter.

2. A pressure-responsive pump organization including: a reciprocable pump element having resilient means to effect expulsion strokes thereof and also an attached handle element, an actuating element having a uniform throw; and a thrust-refusing motion-transmitting means in the form of substantially inflexible open links adapted to so sag as substantially to obviate contact noises between said actuating element and said attached element to impart variable strokes to the latter, one terminal link being provided with means for its pivotal connection to said actuating element and said actuating means being provided with resilient means constantly pressing the same against a cam.

3. A pressure-responsive pump organization including: a reciprocable pump element having resilient means to effect expulsion strokes thereof and also an attached handle element; an actuating element having a uniform throw; and a flexible thrust-refusing motion-transmitting means in the form of substantially inflexible open links adapted to so sag as substantially to obviate contact noises between said actuating element and said attached element to impart variable strokes to the latter, both terminal links being provided with means for pivotal connection.

In testimony whereof I affix my signature.
FRANK N. NUTT.

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