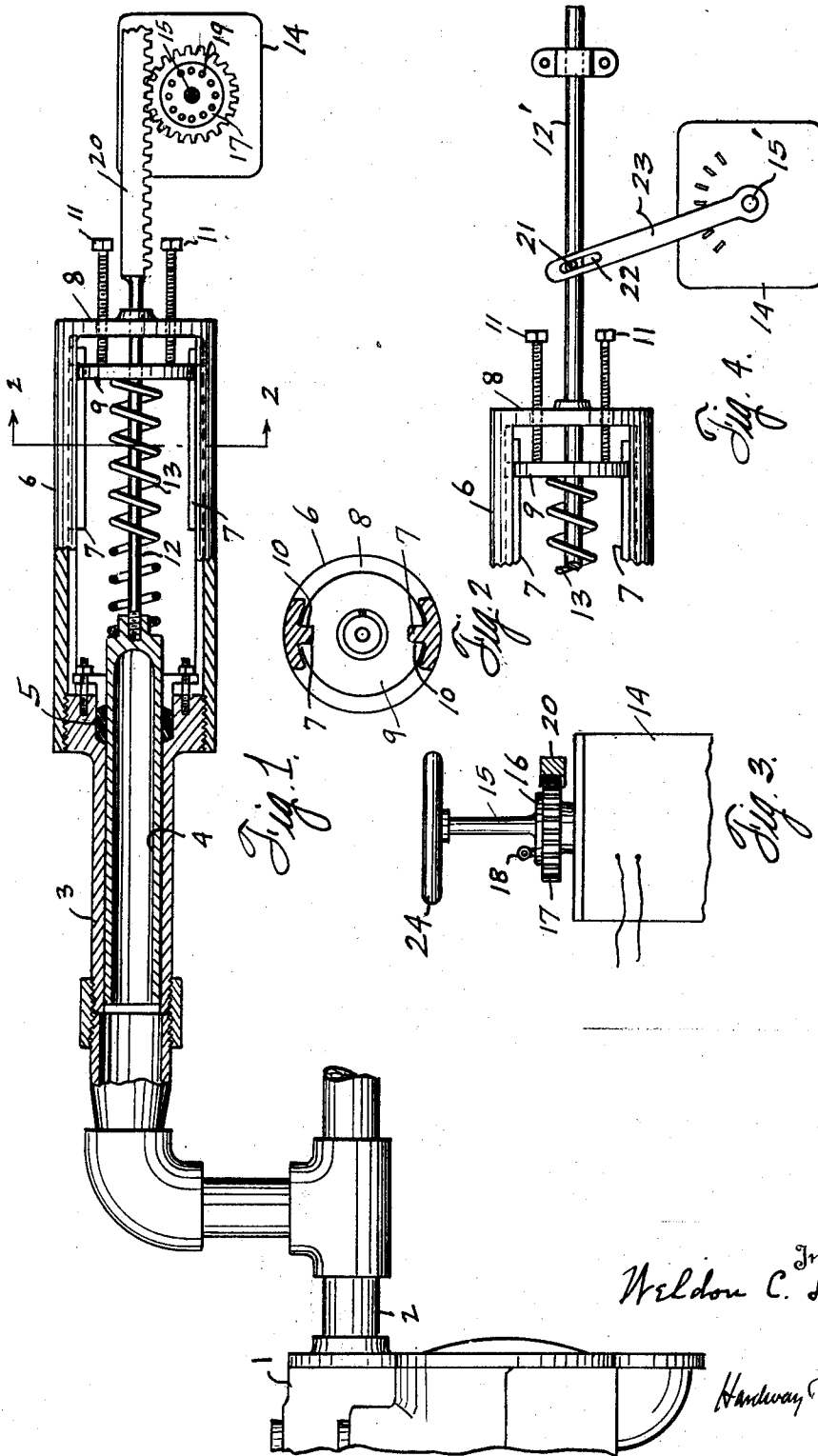


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W. C. LEONARD
FLUID PRESSURE ACTUATOR

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FLUID PRESSURE ACTUATOR

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This invention relates to new and useful improvements in a fluid pressure actuator.

One object of the invention is to provide a device of the character described specially designed to be attached to a fluid pump for the purpose of controlling the operation thereof.

Another object of the invention is to provide a pressure controlling device of the character described specially provided to govern the pressure generator for the purpose of limiting the maximum pressure to be generated; while the device has been specially provided for attachment to fluid pressure pumps it is capable of application generally to fluid pressure generating devices.

With the above and other objects in view this invention has particular relation to certain novel features of construction, operation and arrangement of parts an example of which is given in this specification and illustrated in the accompanying drawing wherein:—

Figure 1 shows a side elevation of the device partly in section shown applied to the discharge line of a fluid pump.

Figure 2 shows a cross sectional view thereof, taken on the line 2—2 of Figure 1.

Figure 3 shows a fragmentary plan view, partly in section, and

Figure 4 shows a fragmentary side elevation of a modified form of the device.

Referring now more particularly to the drawing, wherein like numerals of reference designate similar parts in each of the figures the numeral 1 designates a pump of any conventional construction having the discharge line 2. The pump may be driven by any suitable motor, preferably an electric motor.

Connected into a fluid pressure chamber of the pump, preferably the discharge line 2, there is a cylinder 3 whose outer end is enlarged and externally threaded, and in which there is mounted to reciprocate the tubular plunger 4 whose outer end is closed. Said plunger works through a stuffing box 5 in the outer end of the cylinder 3. Screwed onto the enlarged outer end of the cylinder there is a cage 6 having the oppositely disposed aligned tracks 7, 7 which are united at their

outer ends by the circular end plate 8. There is a disc 9 within the cage which has opposed notches 10, 10 to receive the tracks so as to retain the disc in the cage and to permit it to move along said tracks. Adjusting bolts 11, 11 are threaded inwardly through the end plate 8 and their inner ends form abutments to limit the outward movement of the disc 9.

There is an actuating rod 12 attached to the outer end of the plunger 4 and which works through central bearings in the end plate 8 and disc 9 and a strong coil spring 13 surrounds the rod 12 and is interposed between the outer end of the plunger and the disc 9. The tension on the spring 13 may be regulated by the adjustment of the bolts 11.

There is a conventional electrical controller 14 which controls the current supplied to the pump driving motor. This controller has not been shown in detail for the reason that its construction, method of operation and use are well known to those skilled in the art to which it pertains.

As shown in Figure 1 the controller shaft 15 has an annular flange 16 thereon and adjacent said flange has a spur gear 17 loosely mounted thereon. The spur gear may be keyed to the flange 16 by means of the key 18 which is fitted through a key way in said flange and through one of several keyways 19 in the gear 17.

In the form shown in Figure 1 the outer end of the rod 12 is formed with a rack 20 which is in mesh with the gear 17 and in the form shown in Figure 4 the outer end of the rod 12' has a lateral pin 21 which works through an oblong slot 22 in the outer end of the controller arm 23. The other end of said arm 23 is fixed to the controller shaft 15'.

In operation until the pump pressure exceeds the desired maximum pressure the governing mechanism described will remain inactive, but when said maximum pressure is exceeded the plunger 4 will be moved outwardly by said pressure which in turn will operate through said rack 20 and gear 17, or through the arm 23, as the case may be, to operate the associated controller 14 to slow down the motor and the pump driven thereby to reduce the pressure to the desired maximum limit. The

maximum pump pressure desired may vary and in order to control, or vary, this maximum pressure the key 18 may be removed and the controller shaft 15 turned, by the hand
5 wheel 24, fixed thereon, so as to turn the flange 16 relative to the gear 17 and said key 18 then reinserted, with the result that pressure required to affect the controller may be varied as desired.

10 It is of course obvious that the shaft 15, or 15', may as well be connected with the throttle valve in case a steam engine, or internal combustion motor is employed to drive the pump and the pump pressure thus controlled
15 through mechanism similar to that hereinabove described.

What I claim is:—

In a device of the character described, a cylinder arranged to receive fluid under pressure, a hollow plunger therein whose inner
20 end is open and whose outer end is permanently closed, the outer end of said cylinder being enlarged, a cage, one end of which is threaded onto said enlarged end of the cylinder,
25 said cage having spaced tracks and also having an outer end plate connecting said tracks, an adjustable abutment in the cage having a slidable engagement with said tracks, a yieldable member between the
30 plunger and abutment, said plunger being balanced between fluid under pressure on one side and said yieldable member on the other side, means connected to said end plate for adjusting said abutment, a rod attached to the
35 plunger and working through a bearing in said end plate and forming a guide for the plunger.

In testimony whereof I have signed my name to this specification.

40 WELDON C. LEONARD.

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