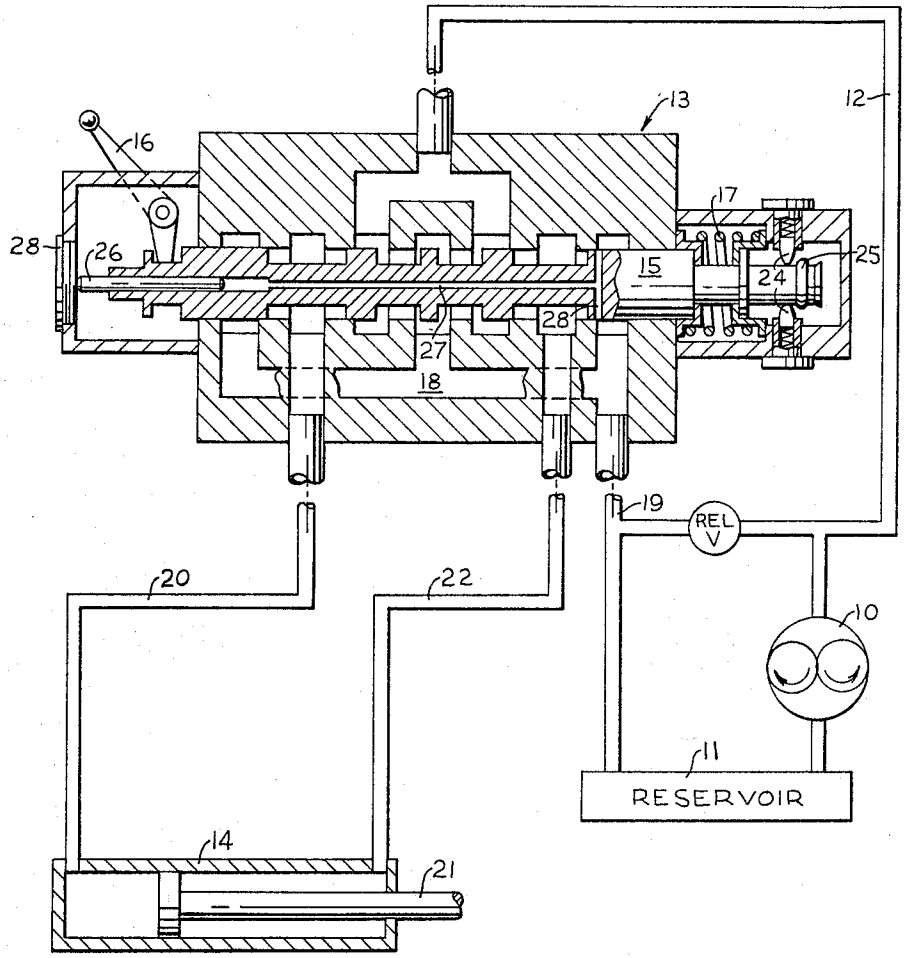
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HYDRAULIC VALVE NEUTRALIZER

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HYDRAULIC VALVE NEUTRALIZER

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1 Claim. (Cl. 137—624.27)

This invention relates to means for causing a hydraulic valve to move to an off or neutral position when work done by the pressure of fluid flowing through the valve is accomplished.

Many types of earthmoving machines have numerous components actuated by hydraulic motors and operating conditions sometimes tax the ability of an operator to adjust all necessary components at one time. For this reason various so-called valve "kickout" mechanisms have been devised to close or neutralize the valve automatically when the function of a component is completed. For example on an earthmoving scraper, a valve is provided to direct fluid to the jack for returning an ejector after it has discharged a load of earth from the bowl. If this valve is held open by a detent and automatically closed when the ejector is returned, the operator's attention may be devoted to apron and bowl control and to driving of the machine itself during the time that the ejector is being returned.

It is to such automatic valve operation that the present invention is directed and it is the object of the present invention to provide a very simple and positive acting valve neutralizer that is contained entirely within the valve housing and utilizes a minimum of moving parts.

Further and more specific objects and advantages of the invention are made apparent in the following specification wherein reference is made to the accompanying drawing.

The drawing is a schematic view of a hydraulic circuit for a jack and including a control valve embodying the present invention shown in section.

A pump shown at **10** in the drawing withdraws hydraulic fluid from a reservoir **11** and directs it through a line **12** and valve generally indicated at **13** to a hydrulic jack **14**. The valve contains a spool **15** adjustable to different positions by means of a lever **16** and normally held in the neutral position shown in the drawing by a conventional centering spring **17**. In the position shown, fluid from the pump passes freely through the valve to a discharge chamber **18** and back to the reservoir by way of a conduit **19**. Movement of the valve spool **15** toward the right from the neutral position shown closes the return passage and opens communication through a line **20** with the head end of the jack **14** causing extension of its piston rod **21**. Upon adjustment of the valve spool to the left in the position shown, fluid under pressure is directed through a line **22** to the rod end of the jack thus retracting the piston rod. Assuming that the jack is one which operates the ejector of an earthmoving scraper, it is the retraction of the rod **21** which would cause return of the ejector to its normal position after it has been employed to eject a load. In this case, it is desirable that the valve spool be retained as by detent mechanism until the piston of the jack reaches the end of its stroke so that once an operator has positioned the valve to cause return of the ejector he can disregard the ejector valve and give his full attention to other operations.

A detent for holding the valve spool in its leftward position which effects retraction of the piston rod **21** is illustrated as a pair of spring biased pins **24** engaging the spool and adapted to ride over an enlargement **25** which encircles the spool and retains the spool in its shifted position against the biasing effect of the spring **17** which tends to return it to neutral. The present invention provides means to overcome the effect of the detent mechanism by urging the spool back toward the neutral position with a force which increases due to a rise in pressure when the piston has reached the end of its travel in the jack. To accomplish this, an elongated pin or piston **26** is slidably fitted in a bore at one end of the spool. A longitudinal passage **27** and a communicating transverse passage **28** both formed in the spool connect the bore in which piston **26** is fitted with the discharge line to the reservoir when the valve is in the neutral position shown. However when the valve is shifted toward the left to direct fluid to the rod end of the jack this bore communicates with pump pressure as it exists in the line **22** and in the valve housing. When the piston of the jack **14** reaches the end of its stroke, a sudden pressure rise takes place in line **22** and this is communicated through passages **28** and **27** to the bore of piston **26** and since this piston is stopped by the housing or by a plug shown at **28** in the housing, a force caused by this sudden pressure rise moves the valve spool toward the right overcoming the holding effect of the detent mechanism and permitting the spring **17** to center or neutralize the spool.

What is claimed is:

In a spool valve having resilient detent mechanism for holding the spool in an open position, means to effect release of said detent when the pressure in the valve exceeds a predetermined value, comprising an axial passageway in said spool extending inwardly from one end of the spool to a point adjacent the other end of the spool, a valve housing enclosing said one end, the portion of said passageway adjacent said one end being enlarged and slidably receiving a piston therein, said passageway at said point being joined by a radial passageway which is in communication with fluid under pressure only when the valve is in open position, an opening in said housing in alignment with said piston and a removable plug closing said opening, said resilient detent mechanism being at said other end of the spool and a lever for operating the valve being at said one end of said spool, said slidable piston being arranged to project from one end of said spool into engagement with said plug to effect release of said detent when pressure is communicated to the end of the piston in the spool, said valve controlling the flow of fluid to a piston operated device, and the pressure for releasing the detent is communicated from the device when the piston thereof reaches the end of its stroke and pressure builds up as a result thereof.

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