Sept. 4, 1956 R. E. DAVIDSON 2,761,390

TIMING DEVICE FOR PUMPS

Filed July 25, 1952

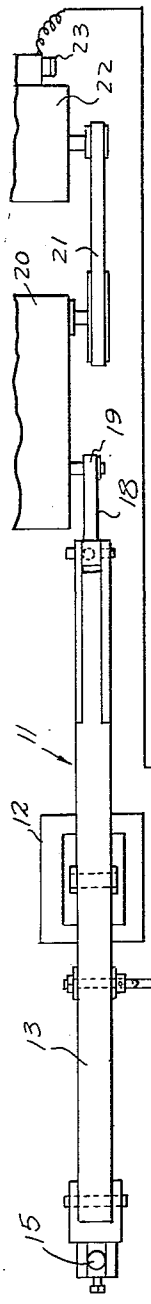


Fig. 1

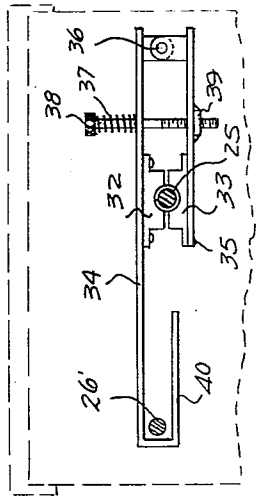


Fig. 3.

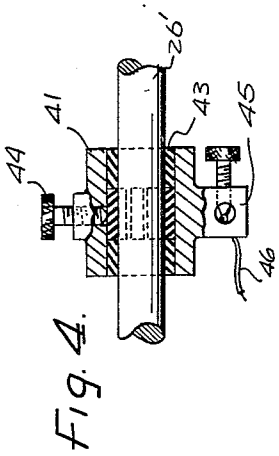


Fig. 4.

Fig. 2.

INVENTOR

Riley E. Davidson,

BY

McMorrow, Berman + Davidson

ATTORNEYS

United States Patent Office 2,761,390
Patented Sept. 4, 1956

2,761,390

TIMING DEVICE FOR PUMPS

Riley E. Davidson, Carmi, Ill.

Application July 25, 1952, Serial No. 300,830

3 Claims. (Cl. 103—27)

This invention relates to timing devices, and more particularly to an improved device for timing the period of operation of a pump, such as an oil well pump.

The main object of the invention is to provide a novel and improved pump timing means adapted to be employed with an oil well pump of the type having a walking beam, the improved timing means being operated directly by said walking beam, being simple in construction, being easy to install, and being reliable in operation.

A further object of the invention is to provide an improved timing means for an oil well pump of the walking beam type, said timing means involving inexpensive components, being sturdy in construction, and being readily adjustable to provide a desired time period of operation of the pump with which it is employed without requiring the fuel tank of the pump motor to be emptied when the operation of the pump is terminated, whereby the pump may be readily restored to operation when required, and whereby the carburetor associated with the operating motor need not be reprimed.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

Figure 1 is a fragmentary top plan view of a portion of a pump of the walking beam type provided with improved timing means according to the present invention.

Figure 2 is a vertical cross sectional view taken on the line 2—2 of Figure 1.

Figure 3 is an enlarged cross sectional detail view taken on the line 3—3 of Figure 1.

Figure 4 is an enlarged cross sectional detail view taken on the line 4—4 of Figure 1.

Referring to the drawings, 11 generally designates a pump of the walking beam type such as is employed with oil wells. The pump comprises the base frame 12 to the top portion of which the walking beam 13 is pivoted, as shown at 14. The piston shaft of the pump, shown at 15, is connected to one end of the walking beam 13, as by a connecting sleeve 16, and the other end of the walking beam is connected by a link bar 18 to the crank 19 which is driven through a gear box 20 and a transmission pulley 21 by an internal combustion engine 22. The engine 22 is provided with an ignition circuit including a magneto 23.

Designated at 24 is a housing in which is journaled a horizontal threaded shaft 25, said threaded shaft 25 extending transverse to the vertical plane of the walking beam 13. Rotatably mounted in the housing 24 parallel to the shaft 25 is a second shaft 26 which projects beyond the end wall 27 of the housing. Rigidly connected to the end of the shaft 26 is the arm 28, the end of arm 28 being connected to the forward portion of the walking beam 13 by a link bar 29, as shown in Figure 2. The shaft 26 is thus drivingly coupled to the walking beam 13 for concurrent oscillatory movement therewith.

Secured on the threaded shaft 25 is a ratchet wheel 30, and engaging said ratchet wheel 30 is a resilient pawl 31 which is secured to the shaft 26. Designated at 32 and 33 are respective opposing nut segments threadedly

engaging the shaft 25 from above and below, as shown in Figure 3, the upper nut segment 32 being secured to an arm 34 and the lower nut segment 33 being secured to an arm 35, as shown, the rear ends of the arms 34 and 35 being pivotally connected together at 36 and the arms being biased towards each other by a coiled spring 37 encircling the upper portion of a headed screw 38 which extends through the upper arm 34 and is threadedly engaged in a boss 39 provided in the lower arm 35, as shown in Figure 3. The screw 38 may be adjusted to vary the amount of biasing force exerted by the spring 37. This adjusts the pressure on the nut segments 32 and 33 which serves to maintain said nuts in threaded engagement with the shaft 25.

The arm 34 is provided with the hook portion 40 which extends around a guide rod 26' secured in housing 24 parallel to shafts 25 and 26. Arm 34 is movable along rod 26' responsive to rotation of the threaded shaft 25. Adjustably secured on the rod 26' is the contact element 41, said contact element 41 being in the form of a sleeve which is insulated from the rod 26' by an insulating lining 43 interposed between the conductive body of the member 41 and the rod 26', as shown in Figure 4. A set screw 44 is provided in the contact member 41 to secure said contact member in an adjusted position on the rod 26'. The contact member 41 is provided with a terminal 45 to which is connected one end of a wire 46 which is connected to one of the magneto terminals of the ignition circuit for the engine 22. The other magneto terminal is grounded and is thus conductively connected to the housing 24 and therefore to the rod 26', as well as to the remaining mechanical elements in the housing 24.

In operation, as the walking beam 13 oscillates, the pawl 31 advances the ratchet wheel 30, thus rotating the shaft 25 through a predetermined angle for each oscillation of the walking beam 13. This advances the nut segments 32 and 33, and at a predetermined time, representing a predetermined number of oscillations of the walking beam 13, the contact arm 40 engages the contact element 41, thus short circuiting the ignition circuit of the engine 22 and causing said engine to stop. By setting the contact element 41 to a suitable position on the rod 26', the pump may therefore be timed to stop after any predetermined number of oscillations of the walking beam 13.

From the above explanation, it will be apparent that the timing means of the present invention may be set to terminate the operation of the pump responsive to a predetermnied specific number of oscillations of the walking beam 13, and thus provides a direct means which terminates operation of the pump after the predetermined number of oscillations of the walking beam have been completed. Furthermore, the arrangement of the present invention allows the operation of the driving motor of the pump to be terminated while there is still a sufficient quantity of fuel in said motor to allow the motor to be readily restarted whenever desired, without requiring the carburetor of the motor to be reprimed, and without requiring a separate supply of fuel for the motor to be maintained apart from the fuel tank of said motor.

While a specific embodiment of an improved means for timing the operation of a pump of the walking beam type has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention, except as defined by the scope of the appended claims.

What is claimed is:

1. In a pump having an oscillating walking beam, and an internal combustion engine drivingly connected to said walking beam, said engine having an ignition circuit, a timing mechanism for said ignition circuit comprising a

rotary shaft, a nut threaded on said shaft, a guide bar supported parallel to said shaft, an arm secured to said nut and engaging said guide bar, a contact secured on said guide bar, circuit means connecting said contact and arm across said ignition circuit, whereby said ignition circuit is short circuited when the arm engages said contact, and means formed and arranged to couple said shaft to said walking beam.

2. In a pump having an oscillating walking beam, and an internal combustion engine drivingly connected to said walking beam, said engine having an ignition circuit, a timing mechanism for said ignition circuit comprising a rotary shaft, a nut threaded on said shaft, a guide bar supported parallel to said shaft, an arm secured to said nut and engaging said guide bar, a contact secured on said guide bar, circuit means connecting said contact and arm across said ignition circuit, whereby said ignition circuit is short circuited when the arm engages said contact, a ratchet wheel on said shaft, arcuately movable pawl means engaging said ratchet wheel, and means formed and arranged to couple said pawl means to said walking beam.

3. In a pump having an oscillating walking beam, and an internal combustion engine drivingly connected to said

walking beam, said engine having an ignition circuit, a timing mechanism for said ignition circuit comprising a rotary shaft, a nut threaded on said shaft, a guide bar extending paralel to said shaft, a second shaft rotatably supported parallel to said first-named shaft, an arm secured to said nut and engaging said guide bar, a contact secured on said guide bar, circuit means connecting said contact and arm across said ignition circuit, whereby said ignition circuit is short circuited when the arm engages said contact, a ratchet wheel on said first-named shaft, a pawl on said second shaft engaging said ratchet wheel, and means formed and arranged to couple said second shaft to said walking beam for concurrent oscillating movement therewith.

References Cited in the file of this patent

UNITED STATES PATENTS

819,287	Klaus	May 1, 1906
2,456,456	Smith	Dec. 14, 1948
2,550,093	Smith	Apr. 24, 1951
2,577,479	Owen et al.	Dec. 4, 1951