Nov. 28, 1933. G. M. PELTON 1,937,244

CONTROL MEANS FOR DOGGING MECHANISM

Filed Oct. 20, 1928

Fig. 1.

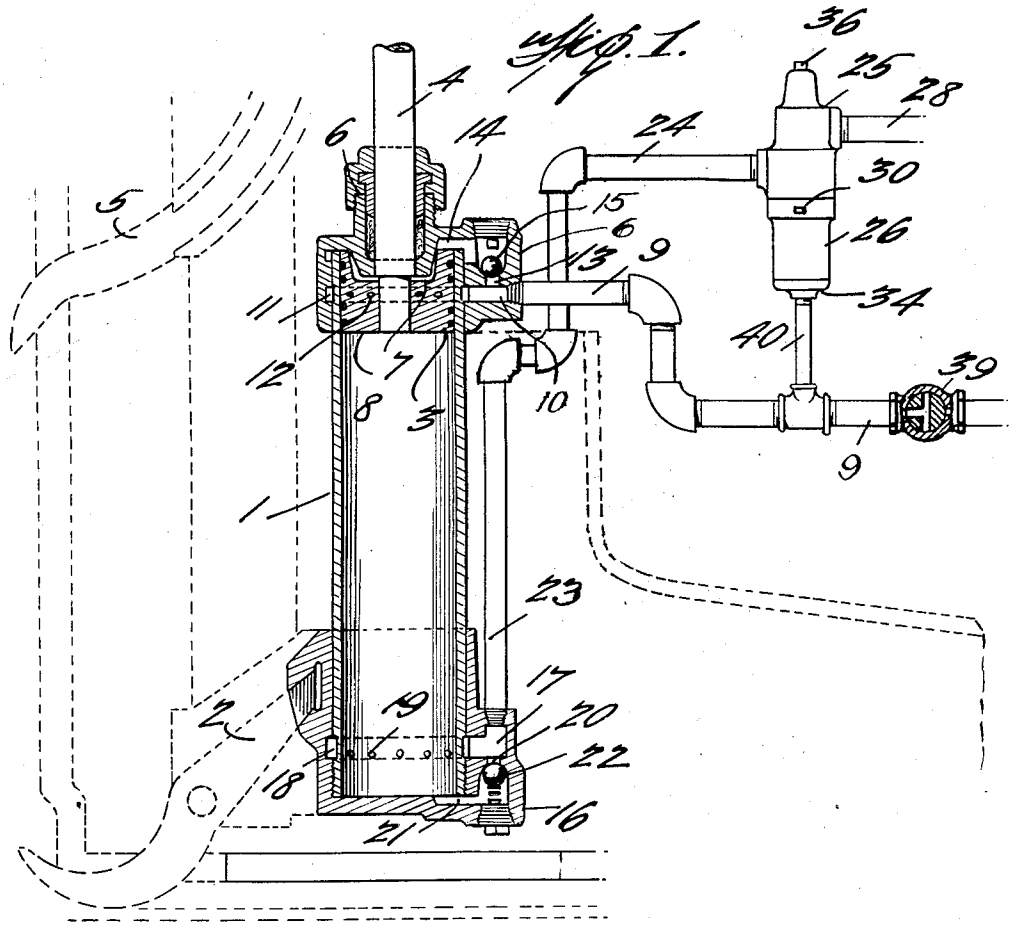


Fig. 3.

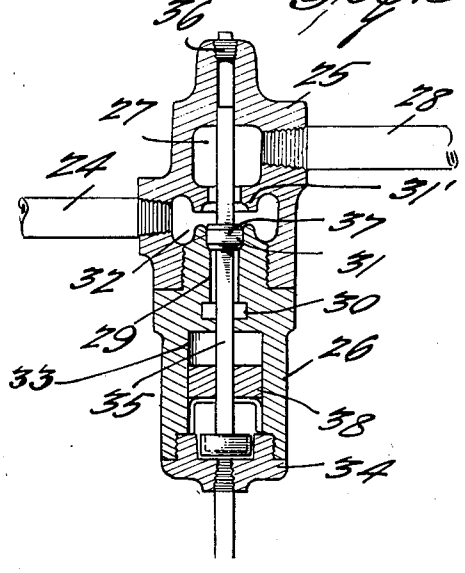
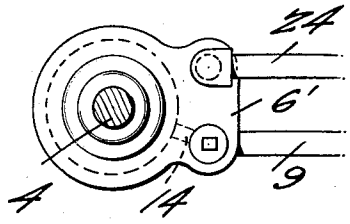


Fig. 2.



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CONTROL MEANS FOR DOGGING MECHANISM

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3 Claims. (Cl. 121—46)

This invention is directed to an improvement in dogging mechanism for saw mill carriages and particularly in a control means for the power mechanism for actuating the dogs.

In dogging mechanism of the type with which this invention is particularly concerned, the dogs are moved to and from dogging position by power mechanism utilizing compressed air as the power medium. As heretofore provided, the power mechanism has been in the form of a cylinder and contained piston connected to the dogs, with pipe line connections and valves for admitting air under pressure to either side of the piston to operate the dogs in the desired direction. As the compressed air is alternately admitted to opposite sides of the system and must be exhausted from the side opposite to that at which power is admitted at each power stroke, it is apparent that ordinarily the air pressure line must be appropriately valved for the alternate admission and exhaustion of the air under pressure, and that furthermore the valves must be manually controlled to secure the desired pressure action and admission.

It is, therefore, an object of the present invention to provide a power means of this type to be actuated by air under pressure in which the admission and exhaustion of the air to and from the respective sides of the piston may be controlled through the operation of a single manually operable valve, whereby the operator is required to manually actuate but a single valve for the selective actuation of the piston in either direction with a resultant saving in time and correspondingly avoiding complication of parts and their upkeep.

A further object of the present invention is the provision of a valve entirely automatic in operation and serving to control at will the admission of air under pressure to the power means while permitting exhaust of the air from but one side of the piston only.

The invention is illustrated in the accompanying drawing, in which:

Figure 1 is a view in elevation, partly in section, showing a power means for operating the dogs of a saw mill carriage and the automatic valve for controlling the admission of air under pressure in the exhaust of such air from the power means.

Figure 2 is a top plan view of the power means.

Figure 3 is an enlarged vertical sectional view of the automatic valve.

The power means for the dogs includes a cylinder 1 to which the lower dog 2 is connected and in which is arranged a piston 3 having a piston rod 4 connected to the upper dogs 5 and passing through a suitably packed head 6 for the cylinder. The piston rod 4 is of such diameter as compared with the diameter of the upper surface of the piston 3 as to materially reduce the pressure area of the upper surface 7 of the piston, while the lower pressure surface 8 of such piston is of the full area of the piston. This constitutes a differential faced piston which, under equal air pressures, will of course move upwardly owing to the greater area of the piston face 8.

The head 6 is formed with an offset 6' into which an air pipe 9 opens, the offset being formed with a port 10 in direct communication with the pipe 9 and opening through the wall of the cylinder 1 through an annular channel 11 having openings 12 to establish communication between said channel and the interior of the cylinder. Above the port 10 the offset is formed with a passage 13 communicating with the port 10 and opening at its upper end into the cylinder above the upper face of the piston, as by a port 14. A valve 15 controls the communication between port 10 and the port 14, this valve opening in the direction of fluid pressure into the cylinder and closing against the pressure in the opposite direction.

The lower end of the cylinder 1 is formed with an offset or enlargement 16 having a port 17 therein leading into an annular channel 18 surrounding the cylinder and communicating with the interior of the cylinder through holes 19. The offset 16 is formed with a passage 20 communicating with the port 17 and opening through a lateral port 21 into the lower end of the cylinder below the lowermost position of the piston 3. The communication between the port 17 and passage 20 is controlled by a spring supported valve 22 which opens under pressure into the cylinder and closes against pressure from the cylinder with respect to the passage 20. The port 17 is in open communication with a pipe section 23 which preferably extends vertically of the cylinder and communicates at its upper end with a pipe section 24.

An automatic valve is provided to control the air pressure admitted to and exhausted from the cylinder 1 below the piston 3; that is to say, for the control of the power medium in connection with pipe 24, this automatic valve being controlled by air under pressure admitted to or exhausted from pipe 9. The automatic valve includes a casing, preferably in two parts 25 and 26, which in connected relation presents an upper chamber 27 into which is led an air pressure pipe 28 in which the air is maintained constantly at full pressure. Below the chamber 27 and communicating therewith is a valve chamber 29 which at its lower end communicates with an exhaust opening 30 leading to the atmosphere or to any other point, if the exhaust air is to be utilized.

The valve chamber is formed with a valve seat 31 immediately above the exhaust opening 30

and with a valve seat 31' immediately below the chamber 27, and the valve chamber is, above the valve seat 31, in open communication with a laterally arranged chamber 32 with which pipe 24 is in open communication. Below the exhaust opening 30 the valve casing is formed with a longitudinally extending bore 33 forming a cylinder, the lower open end of which is closed by a removable head 34. A valve rod 35 is operative in the valve casing, being guided at its upper end above the chamber 27 in a longitudinal bore in the casing closed by a removable plug 36. This valve rod is adapted for movement longitudinally of the valve casing and is provided with a valve 37 adapted in one position to cooperate with the seat 31, and is provided below the valve and within the cylinder 33 with a piston 38 having a non-leaking fit with the cylinder walls.

The pipe 9 is provided with a manually operable valve, indicated at 39, by which the pipe between the valve and cylinder 1 may be opened to the air under pressure or that portion of the pipe between the valve and cylinder opened to the atmosphere. That is, valve 39 is substantially a conventional three-way valve. Beyond the valve 39 relative to the cylinder said pipe is open to the air under pressure. A by-pass communication 40 is in open communication with pipe 9 between the valve 39 and the cylinder 1 and opens into the cylinder 33 of the automatic valve below the piston 38. The by-pass pipe 40 has the usual T connection with the pipe 9 and is threaded into the head 34 to establish the connection.

As previously stated, the pipe 28 is at all times under constant and full air pressure and if the valve 39 has been turned to a position to establish communication between the cylinder 1 above the piston and the atmosphere through the pipe 9, it will be apparent that the air under pressure through pipe 28 will, acting on the surface of valve 37, move said valve downwardly onto its seat 31, thereby cutting off communication between the pipe 24 and the exhaust opening 30 and establishing communication between the pipe 28 and the pipe 24. The piston 3 will then be open to the pressure through pipe 24 and will be moved upwardly in the cylinder 1 to move the dogs to a non-dogging position.

When it is desired to move the dogs to a dogging position, the valve 39 is turned to establish communication between that portion of the pipe in which the air is under constant pressure and that portion opening into the upper end of the cylinder 1. Air under pressure will then be directed through the pipe 9 to the upper end of the cylinder above the piston 3 and will also flow through the by-pass 40. The piston 38 being open to this by-pass pressure and having an area in excess of the area of the valve 37, will force the valve 37 upwardly, cutting off communication between the chambers 27 and 32 and thereby cutting off admission of air under pressure to the pipe 24. The valve in this upward movement establishes communication between the chamber 32 and the exhaust opening 30, thereby permitting the air under pressure in the cylinder 1 below the piston 3 to be exhausted to the atmosphere and permitting the pressure now admitted through the pipe 9 to move the piston downwardly and correspondingly move the dogs for the dogging operation.

Thus, through the use of a single valve 39 and the correspondingly controlled operation of the automatic valve, operative pressure may be selectively admitted to opposite sides of the pistons 3 for the control of the dogging operation.

The provision of the valves 15 and 22 at the respective ends of the cylinder provide for the free admission of air under pressure for operating the piston in the desired direction and at the same time by trapping the air beyond the ports 10 and 17, provide an air cushion to avoid undue impact of the piston at its extreme limits of movement.

What I claim to be new is:

1. In a servo-motor for operating the dogs of a saw mill carriage, including a cylinder and a piston therein connected to certain of the dogs, a pressure pipe line leading to one side of the piston, a manually controlled pipe line leading to the other side of the piston, an automatic valve in the pressure pipe line normally held by the pressure to admit such pressure to one side of the piston, said automatic valve controlling an exhaust from the pressure side of the piston, and means operative under the pressure admitted to the manually controlled pipe line for operating the automatic valve against the pressure to cut off said pressure and open the exhaust.

2. In a servo-motor for operating the dogs of a saw mill carriage, including a cylinder, a piston therein connected to the dogs, a pipe line for admitting fluid pressure to one side of the piston, an automatic valve in said pipe line including a casing having a chamber under fluid pressure, a second chamber in communication with one side of the piston, an exhaust outlet below said second chamber, a valve adapted in one position to open communication between the chambers and cut off the exhaust opening and in another position to establish communication between the second chamber and the exhaust opening, said valve being normally held by the fluid pressure of the first chamber in position to establish communication between the chambers, a second pipe line to admit fluid pressure to the other side of the piston, and means whereby the fluid pressure in the second pipe line will actuate the valve to cut off communication between said chambers and establish communication between the second chamber and the exhaust opening.

3. In a servo-motor for operating the dogs of a saw mill carriage, including a cylinder, a piston therein connected to the dogs, a pipe line for admitting fluid pressure to one side of the piston, an automatic valve in said pipe line including a casing having a chamber under fluid pressure, a second chamber in communication with one side of the piston, an exhaust outlet below said second chamber, a valve adapted in one position to open communication between the chambers and cut off the exhaust opening and in another position to establish communication between the second chamber and the exhaust opening, said valve being normally held by the fluid pressure of the first chamber in position to establish communication between the chambers, a second pipe line to admit fluid pressure to the other side of the piston, means whereby the fluid pressure in the second pipe line will actuate the valve to cut off communication between said chambers and establish communication between the second chamber and the exhaust opening, and means for manually controlling the admission of pressure to the second pipe line.

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