

(No Model.)

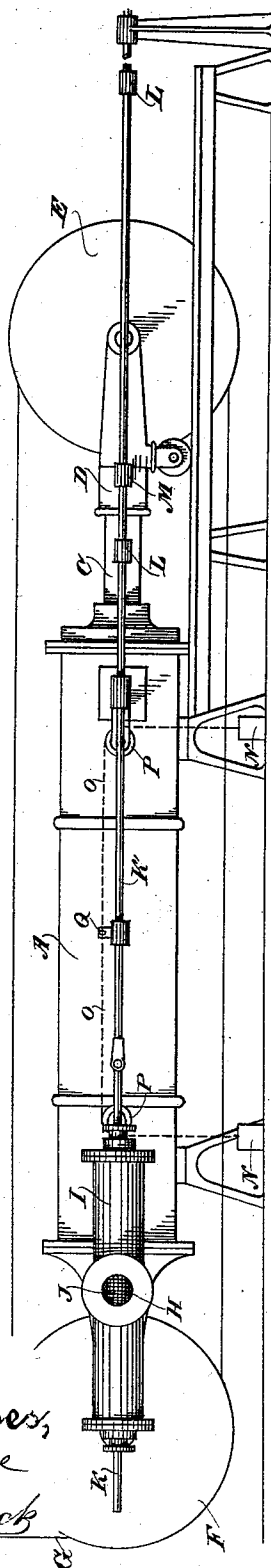
A. J. McNICOLL.

ELEVATOR CUT-OUT VALVE ATTACHMENT.

No. 542,421.

Patented July 9, 1895.

Fig. 1.



Witnesses,
J. P. Aschick

Fig. 2.

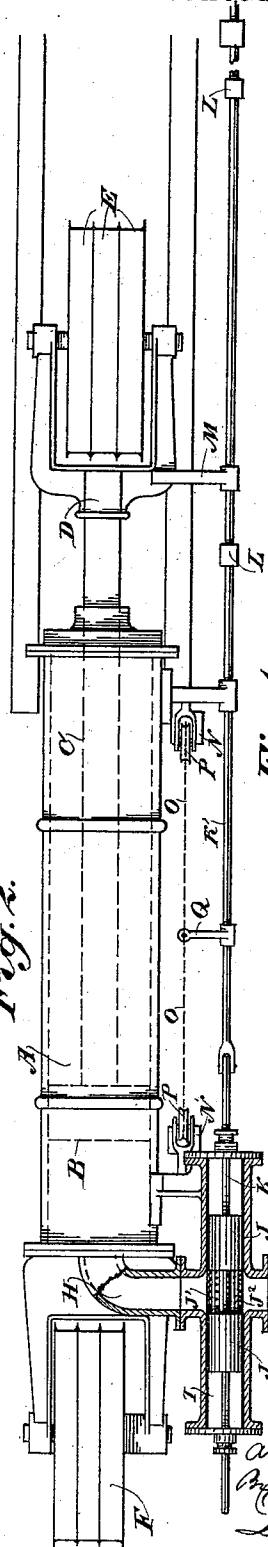


Fig. 3.

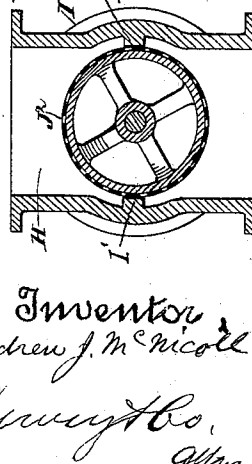


Fig. 4.

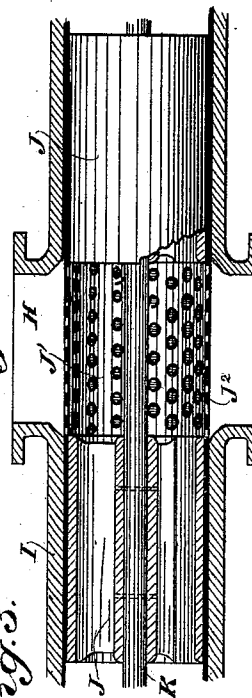
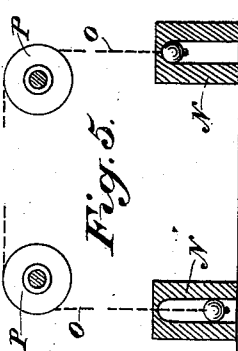


Fig. 5.



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UNITED STATES PATENT OFFICE.

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ELEVATOR CUT-OUT-VALVE ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 542,421, dated July 9, 1895.

Application filed December 3, 1894; Serial No. 530,732. (No model.)

To all whom it may concern:

Be it known that I, ANDREW J. McNICOLL, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Elevator Cut-Out-Valve Attachments; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an attachment for elevators.

It consists of the constructions and combinations of parts hereinafter fully described and claimed.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a side elevation of an elevator-cylinder and connected parts, showing the application of my device. Fig. 2 is a plan view showing the supplementary cylinder. Fig. 3 is a section through this supplementary-cylinder, taken at right angles to Fig. 2. Fig. 4 is a longitudinal section of the same. Fig. 5 is a detail of the weights.

A is a cylinder, shown in the present case as fixed in a horizontal position, having the plunger B, adapted to reciprocate therein, the plunger rod C, connecting with the cross-head or traveler D, which carries a series of pulleys E, movable with it. At the opposite end of the cylinder are fixed corresponding pulleys F, and the elevator-rope G passes around these sets of pulleys, there being as many pulleys as will be necessary to multiply the motion of the rope sufficiently to raise the elevator-cage to the desired height with the length of cylinder in use. Water is admitted into the cylinder through a pipe H to move the plunger and raise the load, and its admission and escape are controlled by any suitable form of valve, not here shown, these valves being usually actuated by means of a rope or cord extending upward alongside the elevator-cage, so as to be within reach of the operator at all times. If such a cord breaks, or it or the valve becomes disabled so that the valve cannot be closed when the piston approaches the end of the cylinder, there is danger of breaking the machinery by reason of the piston being driven to the end of its stroke by the full pressure of the water, thus causing it to strike the end of the cylinder, and if the cage be going up there is danger

of it being carried beyond its highest point into the sheaves at the top, which may cause a dangerous accident by breaking the suspending-rope or other parts. My invention is designed to prevent such accidents by automatically cutting off the water at each end of the stroke of the machine without reference to the operation of the manually-operated valve. As it cuts off automatically at each end of the stroke, whether the manually-operated valve acts or not, it always causes the mechanism to work smoothly.

In carrying out my invention I have here shown a cylinder or chamber I, the central portion of which has a transverse passage extending through it and connecting on one side with the pipe H, which supplies the cylinder, and on the other side with the pipe leading from the source of supply and the main valve, which is not here shown. A lining J² fits the cylinder and is perforated to correspond with the passage H and valve-port.

The valve consists of two imperforate open-ended cylinders J J', fixed upon a valve-rod or stem K and slidable longitudinally within the casing J², so as to leave an open space between them equal in length to the diameter of pipe or passage H. When this valve is in its normal central position, this open space coincides with the passage H and the perforated portion of the lining J², and when the main controlling-valve is opened water flows through the supply-pipe, the perforations in J², and the pipe H to the cylinder. When the valve is moved so that either of its imperforate ends coincides with the pipe H and the supply-pipe, the flow of water is cut off; but the valve fits loosely enough to allow water to pass it slowly, when the main supply-valve is opened, so as to move the piston a little way in the cylinder to return the parts to their normal position, as will be hereinafter described.

I prefer to enlarge the cylinder I a little at its junction with the supply-pipe and the pipe H, as shown in Figs. 3 and 4, in order to allow the water to have free access to and escape from the perforated lining around nearly its whole circumference. Ribs I' extend from the walls of this enlargement to the lining J² on each side to prevent the water from passing around the outside of the lining.

The valve-rod K is connected with the valve, and is here shown as passing through stuffing-boxes at each end of the cylinder I. A rod K', forming an extension of the valve-rod, is movable through suitable guides, and has fixed upon it the lugs or collars L.

M is an arm projecting from the cross-head or traveler D, to which it is fixed, and having its end bored so as to fit loosely upon the rod K', or otherwise so constructed as to move close to the rod, so that when the traveler has nearly reached either end of its stroke this arm will strike the collar L upon the rod and will thus move the rod, and with it the valve J J, so that the valve moving in the same direction with the traveler and cylinder-piston will be moved along until the perforate end J lies across the supply-passage in the cylinder and prevents further entrance of water under full pressure.

In order to return the valve to its normal position, in which the central port J' stands in line with the supply-passage, I employ weights N, having cords or ropes O passing over direction-pulleys P in line above them, and these ropes extend from the direction-pulleys to a collar Q, which is fixed to the rod K' between the pulleys P, so that when the valve J and the rod K K' have been moved in one direction, as previously described, to bring the closed portion J of the valve across the supply-opening, one of the weights N will be lifted by this action.

The valve J J fits loosely enough in the cylinder to allow the water to pass it slowly when the main supply-valve is again opened for the purpose of returning the piston in the hydraulic cylinder to either end, and the first movement of the piston and the traveler D will carry the arm M out of contact with the collar L, upon which it acted to move the valve J and raise the weight N. This allows the weight N, which was raised, to act upon the rod K K' and the valve J J' so as to return the latter to its central position, thus bringing the port in the valve into line with the supply-passage, which is then in condition to again supply water to the cylinder in the usual manner, or to allow the water to escape when the cage is descending.

It will be manifest that springs may be substituted for weights with the same results, and it is intended that the equivalent shall be understood wherever the word "weight" is used.

It will be seen that by this construction my cut-off valve or plunger is moved in the same direction as the hydraulic cylinder-piston and cross-head are moving, and that the cut-off is produced by direct closure in either direction without any reverse mechanism.

The resetting device operates automatically, after the cut-off has done its work, to return it to its central position with the port in line with the supply-passage.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An elevator cut out valve attachment, consisting of a cylindrical valve chamber with closed ends and stuffing boxes for the passage of a valve rod, a valve fixed to said rod and movable loosely in said chamber parallel with the main hydraulic cylinder, and comprising cylindrical end portions normally open at both ends for the free passage of water through the valve whereby the valve is balanced, and an intermediate port normally corresponding in position with the transverse passage made through the valve chamber and connecting the main cylinder with the source of supply and controlling valve, an extension of the valve rod having fixed collars and an arm fixed to the piston rod cross head adapted to strike the collars and move the valve in the same direction with the piston and without intermediate levers, and means connected with the valve-rod for returning the valve to its normal position when the main supply valve is open.

2. An elevator cut out valve attachment, consisting of a valve moving loosely in a valve chamber parallel with the main hydraulic cylinder and comprising cylindrical end portions normally open at both ends for the free passage of water through the valve whereby the valve is balanced, and an intermediate port normally corresponding in position with the transverse passage made through the valve chamber and connecting the main cylinder with the source of supply and controlling valve, a stem or rod connected with the valve and means whereby it is actuated by the movement of the cylinder cross head.

In witness whereof I have hereunto set my hand.

ANDREW J. MCNICOLL.

Witnesses:

S. H. NOURSE,
H. F. ASCHECK.