

UNITED STATES PATENT OFFICE.

JOHN G. HODGSON, OF MAYWOOD, ILLINOIS, ASSIGNOR TO NORTON BROTHERS, OF CHICAGO, ILLINOIS.

DEVICE FOR REGULATING STEAM-PUMPS.

SPECIFICATION forming part of Letters Patent No. 669,257, dated March 5, 1901.

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To all whom it may concern:

Be it known that I, JOHN G. HODGSON, a citizen of the United States, residing in Maywood, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Devices for Automatically Controlling or Regulating Steam-Pumps for Hydraulic Cylinders, of which the following is a specification.

The object of my invention is to provide an automatic pump-controlling device of a simple, efficient, and durable construction which will reliably and properly control the action of the pump so as to maintain a substantially uniform water-pressure in the hydraulic ram and prevent sudden shocks to or jarring action of the pump and other parts.

My invention consists in the means I employ to practically accomplish this result—that is to say, it consists, in connection with the pump and the steam-cylinder and piston for operating the pump and the steam-valve which controls the working of the engine, of an upright water-cylinder connected with the pump and having a movable piston supporting a heavy weight and a lever connected with the steam-valve and provided with a spring tending to close it, and said valve-lever having a weight connected through a flexible connection with its other arm, which operates to open the steam-valve when the weighted piston of the water-cylinder drops low enough to permit said weight to act on the valve-lever, said weight resting partially or entirely on the weighted piston when said piston stands at or above the proper height. The spring, which tends to open the valve-lever, at all times partially supports or counteracts the weight, which tends to close the valve-lever. When the weighted piston rises too high or above its normal height, the spring, acting on the valve-lever, closes the valve and diminishes the action of the pump. The weight on the piston of the water-cylinder is sufficiently great in respect to the area of said piston to give or maintain the required hydraulic pressure.

In the accompanying drawing, which forms a part of this specification, I have illustrated in side elevation a machine or apparatus embodying my invention.

In said drawing, A represents a pump by

which water under pressure is supplied to a hydraulic cylinder through the pipe A', leading thereto.

B is a steam or other engine for operating the pump, and C is the valve or device for controlling or regulating the supply of steam or other power to the engine, said valve being opened more or less according to the work required from time to time, and C' is the lever or handle of said valve.

D is an upright water-cylinder, preferably of some considerable capacity and to which water under pressure is supplied from the pump A through the pipe b. This water-cylinder D has a piston D', adapted to move up and down in the same and carrying a heavy weight D² on its upper end, said weight corresponding to the degree of hydraulic pressure normally required. The weight preferably consists of a tank or vessel, so that the same can be filled to a greater or less extent with pieces of iron or other heavy substance and the amount of weight on the piston thus regulated according to needs.

F is a valve-operating lever having an arm f, connected with the valve-lever C' by a link F'. This arm f also has connected to it a spring G, which tends to close the valve-lever. The other arm f' of the valve-operating lever F has connected to it by a chain or flexible connection h a weight H, sufficiently heavy to overcome the tension of the spring G, and which weight tends to open the steam-valve C. This weight H is adapted to rest upon and be supported or partially supported by the weighted piston D' of the water-cylinder through a shelf or bracket d, connected thereto or to the weight carried thereby, when the weighted piston stands at its normal or proper height or is raised above the same. In operation when the water and water-pressure supplied by the pump to the hydraulic ram fall below that required for the work being done, the weighted piston D' of the water-cylinder D descends under action of its weight, thus leaving the steam-valve-operating weight H unsupported or free to act upon the lever F, and thus further open the steam-valve, and thereby accelerate the action and force of the engine and pump to the extent required, be it more or less, to restore and maintain the water-supply and water-

pressure at the point required. If, on the other hand, the water-supply and water-pressure produced by the pump at any time exceed that required by the work being done, the weighted piston D' of the water-cylinder D will rise above its normal height, thus further supporting or lifting the valve-operating weight H and permitting the spring G to further close the valve C and reduce the supply of steam or power, and thus diminish the action of the pump until the weighted piston D' again assumes its normal height or position. As the connection between the weighted piston and the steam-valve is thus direct and positive, its regulating action, whether to increase or decrease the supply of steam, is almost instantaneous, so that the hydraulic pressure produced by the pump is maintained substantially uniform and prevented from sudden variation, and as the upright water-cylinder D itself contains a material reserve supply of water under pressure, owing to its weighted piston, which reserve supply is sufficient to meet momentarily any sudden supply called for by the hydraulic ram or work being done and until the supply produced by the pump is increased, as required, by reason of the engine being under such quick control, as before described, the result is that the pump is caused to work with substantially absolute smoothness and afford a perfectly uniform water-pressure, thus preventing all shocks to the mechanism and all tendency to produce any water-hammering, jarring, or chugging action.

I claim—

1. The combination with a pump, its oper-

ating engine and valve or device for controlling the action of the engine, of an upright water-cylinder connected with the pump and having a weighted piston, of a valve-operating lever having a weight and a flexible connection between said weight and lever for operating the same, the action of which weight upon said valve-lever is arrested by the weighted piston of the water-cylinder when said piston rises too high, substantially as specified.

2. The combination with a pump, its operating engine and valve or device for controlling the action of the engine, of an upright water-cylinder connected with the pump and having a weighted piston, of a valve-operating lever having a weight for operating the same, the action of which weight upon said valve-lever is arrested by the weighted piston of the water-cylinder when said piston rises too high, said valve-operating lever having a spring tending to close the valve, substantially as specified.

3. The combination of pump A with engine B, steam-valve C, lever C', upright cylinder D, having weighted piston D', valve-operating lever F, having arms *f f'*, spring G, and weight H having a flexible connection with the valve-operating lever and adapted to be supported by the weighted piston D' when said piston rises too high, substantially as specified.

JOHN G. HODGSON.

Witnesses:

EDMUND ADCOCK,
H. M. MUNDAY.