

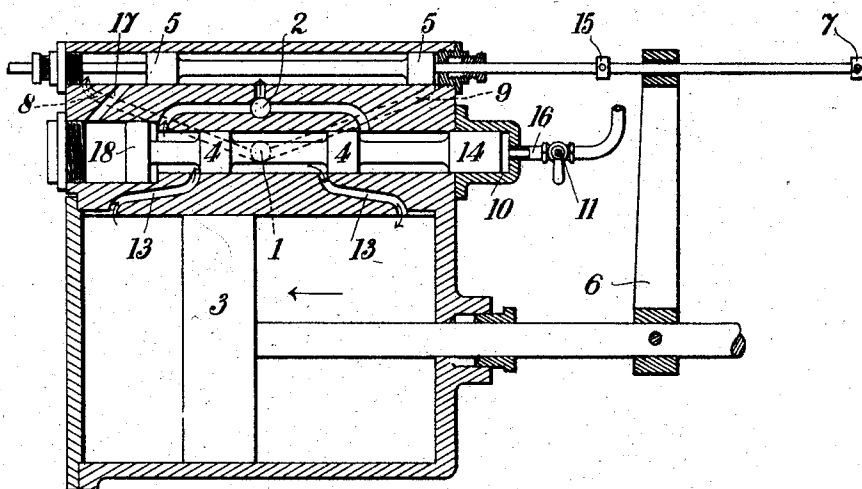
No. 773,111.

PATENTED OCT. 25, 1904.

W. R. WOOD.
MEANS FOR OPERATING VALVES.

APPLICATION FILED JULY 14, 1903.

NO MODEL.



WITNESSES.

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UNITED STATES PATENT OFFICE.

WILFRED ROTHERY WOOD, OF LONDON, ENGLAND.

MEANS FOR OPERATING VALVES.

SPECIFICATION forming part of Letters Patent No. 773,111, dated October 25, 1904.

Application filed July 14, 1903. Serial No. 165,482. (No model.)

To all whom it may concern:

Be it known that I, WILFRED ROTHERY WOOD, engineer, a subject of the King of Great Britain, residing at 31 Walbrook, in the city of London, England, have invented certain new and useful Improved Means for Operating the Valves of Steam-Cylinders, of which the following is a specification.

This invention relates to improved means for operating the valves which govern the inlet and exhaust ports of steam-cylinders containing a piston and is mainly intended for use where it is desired to impart to such pistons an intermittent motion in one or both directions.

According to this invention it is proposed that the movement of the valve governing the admission of steam or other pressure should in turn be governed or controlled by a constant pressure exerted on the valve in one direction and an intermittent pressure acting on said valve in the other direction.

The preferable construction is one in which the constant pressure in one direction is exerted on the valve through a piston in a cylinder open to the water-pressure from a boiler, overhead supply, or from a constant-pressure main, the flow to and fro being governed by a valve or by the size of the pipe, motion to the valve as against such head or pressure being obtained by the admission of fluid-pressure to a piston acting in the opposite direction on the main valve, the area of which should be sufficient to enable the pressure thereon to be greater than that exerted on the constant-pressure piston, whatever that may be.

The accompanying drawing in sectional elevation illustrates such preferred construction.

In said figure, 1 represents the steam or fluid pressure inlet; 2, the exhaust; 3, the main piston; 4, the main valve, carrying at its outer end a piston 18 the area of which is sufficient to enable the pressure thereon to be greater than that which will be exerted on the outer face of the piston 14 when pressure is on such outer face; 5, the auxiliary valve, here shown as being operated from the main piston-rod through the arm 6 and the tappets 7 and 15. 10 represents the cylinder containing pis-

ton 14 and connected by pipe 16 to the water of the boiler or other source of constant pressure, and 11 a valve in such pipe.

With the construction shown steam entering through 1 is forcing the piston 3 to the left, valve 5 being balanced, the pressure and exhaust passages being indicated by 8, 9, 13, and 17. On the opposite side of piston 3 the connections are open to exhaust, as is also the space between the pistons in the auxiliary valve 5. The pressure through 8 is also open to the outer end of piston 18 through passage 17, and consequently piston 14 is in its extreme right-hand position. As piston 3 is reaching the end of its stroke arm 6 will come in contact with tappet 15 and throw the auxiliary valve to its extreme left-hand position, thus cutting off the supply of pressure to the outer face of piston 18 and opening same to exhaust 2. The pressure through 16 will then force piston 14 to the left, the speed of motion being regulated by the size of the pipe 16 or position of valve 11, when the main valve is thus thrown over the steam admission and exhaust from the main cylinder is reversed, as will be readily understood.

It has heretofore been proposed to use a dash-pot in connection with a main and auxiliary steam-valve for the purpose of obtaining a cushioning effect in the main cylinder; but such an arrangement does not enable an appreciable intermittent motion or dwell of the main piston to be obtained, and it is this result that the present invention is intended to secure. It has also been proposed to actuate the valves of steam-cylinders by subjecting them to a constant steam-pressure in one direction and an intermittent pressure and exhaust in the other direction; but wherever this is the case the valve has a jumping and uneven movement, due to the natural elasticity of the fluid and in addition to this given a constant boiler-pressure, the rapidity of movement of the valve is unalterable, and the speed of stroke of the main piston cannot be varied. By substituting a constant liquid-pressure in one direction and by providing means, as by the valve 11, whereby the rapidity of flow of liquid to and from the cylinder 10 can be regulated as called for by the present inven-

tion not only is the jumping motion of the valve obviated and a uniform movement obtained, but it is also possible with a constant boiler-pressure to immediately vary the rapidity of stroke of the valve, and in practical tests this has been done within the wide limits of variation of from one stroke every three minutes to fifteen strokes a minute, thus rendering the apparatus extremely useful in cases where a sudden demand for increase speed of stroke is desired.

What is claimed is—

1. The improved means for operating the valves of steam-cylinders so as to produce therein a dwell or period of rest which consists of combining with said valve a piston subjected to constant liquid-pressure in one direction, and a second piston submitted to intermittent steam pressure and exhaust in the opposite direction.

2. The improved means for operating the valves of steam-cylinders so as to produce therein a dwell or period of rest which consists of combining with said valve a piston subjected to constant liquid-pressure in one direction, and a second piston subjected to intermittent steam pressure and exhaust in the opposite direction, a main cylinder and a piston therein whose motion is in turn governed by the position of the main valve.

3. The improved means for operating the valves of steam-cylinders so as to produce therein a dwell or period of rest which consists of combining with said valve a piston subjected to constant liquid-pressure in one direction, and a second piston subjected to intermittent steam pressure and exhaust in the opposite direction, a main cylinder and a piston therein whose motion is in turn governed by the position of the main valve, and an auxiliary valve adapted to alternately open the inlet and exhaust to the outer face of the second piston.

4. The improved means for operating the

valves of steam-cylinders so as to produce therein a dwell or period of rest, consisting of a combination with said valve of a piston subjected to constant liquid-pressure in one direction, and a second piston submitted to intermittent steam pressure and exhaust in the opposite direction, and means for regulating the rapidity of flow of liquid to and from the constant-pressure piston.

5. The improved means for operating the valves of steam-cylinders so as to produce therein a dwell or period of rest, consisting of a combination with said valve of a piston subjected to constant liquid-pressure in one direction, and a second piston subjected to intermittent steam pressure and exhaust in the opposite direction, a main cylinder and a piston therein whose motion is in turn governed by the position of the main valve, and means for regulating the rapidity of flow of liquid to and from the constant-pressure piston.

6. The improved means for operating the valves of steam-cylinders so as to produce therein a dwell or period of rest, consisting of a combination with said valve of a piston subjected to constant liquid-pressure in one direction and a second piston subjected to intermittent steam pressure and exhaust in the opposite direction, a main cylinder and a piston therein whose motion is in turn governed by the position of the main valve, and an auxiliary valve adapted to alternately open the inlet and exhaust to the outer face of the second piston and means for regulating the rapidity of flow of liquid to and from the constant-pressure piston.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILFRED ROTHERY WOOD.

Witnesses:

ALLEN PARRY JONES,
A. KNIGHT CROAD.