

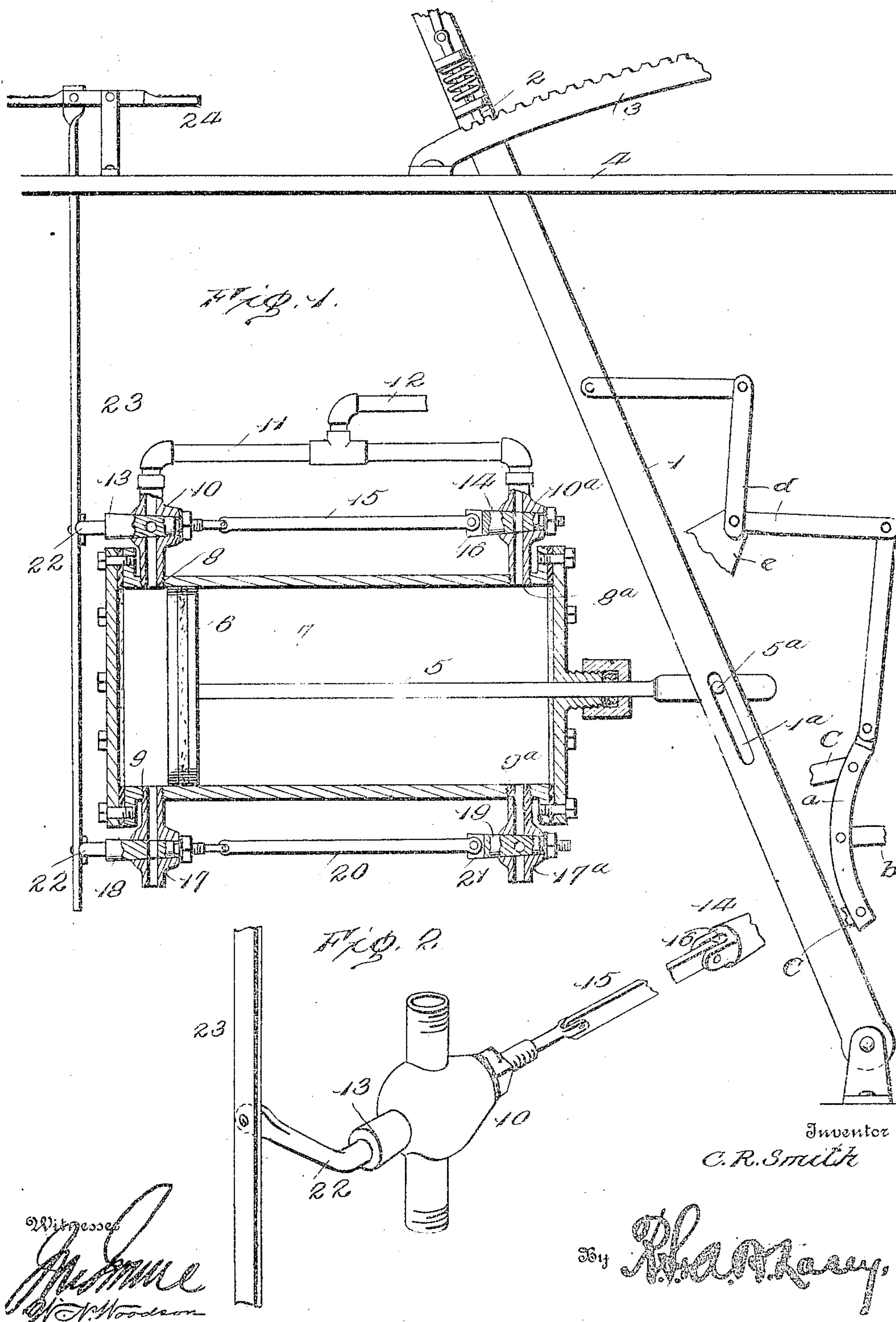
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C. R. SMITH.

MEANS FOR OPERATING REVERSE LEVERS OF ENGINES.

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UNITED STATES PATENT OFFICE.

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MEANS FOR OPERATING REVERSE-LEVERS OF ENGINES.

No. 887,132.

Specification of Letters Patent.

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Application filed May 31, 1907. Serial No. 376,518.

To all whom it may concern:

Be it known that I, COVERT R. SMITH, citizen of the United States, residing at Freeport, in the county of Harrison and State of Ohio, have invented certain new and useful Improvements in Means for Operating Reverse-Levers of Engines, of which the following is a specification.

This invention contemplates certain new and useful improvements in reversing mechanism for engines, and the present invention relates more particularly to an improved means or mechanism for operating levers of engines, the object of the invention being to provide such a mechanism that the engine man or driver may sit erect and watch the signals of the trainmen or the like and keep his hand on the steam lever and at the same time, reverse his engine any number of times without moving his position. In the present embodiment of the invention as illustrated, the mechanism of my invention is shown as actuated by a slight movement of the operator's ankle or foot, but it is to be understood that various other means may be employed to accomplish the purpose for which this invention is designed.

With this and other objects in view as will more fully appear as the description proceeds, the invention consists in certain constructions, arrangements and combinations of the parts that I shall hereinafter fully describe and then point out the novel features in the appended claims.

For a full understanding of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a side elevation of my improved operating mechanism for the reverse lever of an engine, parts being shown in section, and Fig. 2 is a detail perspective view of the valve mechanism.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

Referring to the drawings, the numeral 1 designates the reversing lever of an engine of any type, *a* designates the reversing link connected to the valve rod *b* and eccentric rods *c*, and *d* designates the ordinary rocker arm fulcrumed on any fixed support as at *e*, and connected by links to the reversing link *a*

and lever 1, respectively. These parts are conventionally shown on a reduced scale for purposes of illustration only.

4 designates the support for the main operating device of my invention, the said support being, for instance, the floor of a locomotive cab, or the platform of a hoisting engine, or in fact a support of any character whatever, it being understood that the reversing lever 1 projects upwardly from the support and is adapted to be manipulated by the engine man or operator. My invention, is designed, as above indicated, to actuate this reverse lever by other means than the direct application of the engine man's hand thereto, and aims to do away entirely with the necessity of grasping the hand lever or reversing lever 1, so that the engine man's hands will be free for any other purpose. In order to effect this result, I provide a piston rod 5 which may be guided in any suitable manner and which is provided with a pin 5^a accommodated by a longitudinal slot 1^a formed in the reversing lever 1.

6 designates the head of the piston rod, or piston, said piston 6 being mounted within a cylinder 7. This cylinder is provided at its ends with inlet ports 8, 8^a and complementary exhaust ports 9, 9^a. Inlet cocks 10, 10^a are screwed or otherwise secured in the respective inlet ports 8, 8^a. 13 and 14 designate respectively the turning plugs of said cocks. A rod 15 is connected at one end to the stem of the plug 13 to turn therewith, and the other end of said rod is removably mounted in a non-circular socket 16 formed in the adjacent end of the other plug 14. The plugs 13 and 14 are set at right angles to each other as regards their ports, that is, one plug is always closed when the other is open.

Exhaust cocks 17, 17^a are screwed or otherwise secured in the respective exhaust ports 9, 9^a of the cylinder 7, and 18 and 19 designate respectively the turning plugs of said cocks. These plugs are also connected by a rod, designated 20, said rod being rigidly secured to the stem of the plug 18, with one end fitting in the socket 21 of the opposite plug 19. Relative to these cocks also it is to be understood that one plug is always closed when the other is opened. The plugs are connected for simultaneous actuation by means of cranks 22 that are formed as integral parts of, or suitably connected to the plugs 13 and 18 and that are both connected

to an actuating rod 23. This rod may extend upwardly through the floor or other support 4, the upper end of said rod being connected to a foot treadle 24 fulcrumed intermediate of its ends on the support 4; or to any form of actuating lever or means for raising and lowering the rod 23.

In the practical operation of my improved mechanism for operating the reverse lever of engines, it is to be understood that the cylinder 7 may be supplied with steam or air or any other motive fluid, by means of pipes 11 connected to the inlet cocks 10, 10^a and to a common supply pipe 12 in turn connected to any suitable source of supply, (not shown). By rocking the foot pedal 24 or otherwise raising or lowering the actuating rod 23, it is obvious that the motive power may be permitted to flow in one end of the cylinder or the other so as to actuate the piston in the direction it is desired to turn or swing the reverse lever 1. As the plugs 13 and 14 and exhaust plugs 18 and 19 are arranged with their ports at right angles, it is obvious that the exhaust cock 17^a will be open when the inlet cock 10 is opened, and the cocks 10^a and 17 will be closed at this time. With such adjustment of the parts the piston 6 will travel to the right of the cylinder as shown in the illustration. The reversal of this movement is obvious and needs no further explanation.

From the foregoing description in connection with the accompanying drawings, it is obvious that I have provided a very simple, durable and efficient construction of means for operating the reverse lever of engines of any type, it being possible for the engine man to keep his hand on the steam lever and reverse the engine repeatedly without moving his position at all. He may therefore sit erect and watch the signals of his trainmen or other assistants, and when a foot treadle is employed as the main actuating device for the apparatus, it is obvious that the engineer's hands may be employed in diversified ways without the necessity of grasping the lever 1 to reverse the motion of the engine. If desired, the quadrant catch or detent 2 may be held free from the quadrant as by a loop slipped over the handle, or by any other means.

While I have shown the mechanism as applied to the usual hand operated reversing lever 1, it is obvious that it may be adapted to either of the working parts of a reversing mechanism, and it is also evident that the invention may operate the reversing mechanism even if the hand lever 1 be entirely dispensed with.

It is obvious that by extending the piston rod 5 to the link motion, the lever 1 as well as the quadrant 3 may be dispensed with.

Having thus described the invention, what is claimed as new is:

1. Means for actuating the reversing mechanism for engines comprising a cylinder, a piston mounted in said cylinder, the cylinder being provided in its ends with inlet and exhaust ports, inlet and exhaust cocks secured in said inlet and exhaust ports and provided with plugs or valves, a connection between the plugs of the inlet cocks, the said plugs being connected with their ports at right angles to each other, a similar connection and arrangement between the valves or plugs of the exhaust cocks, means for simultaneously actuating the inlet cocks and the exhaust cocks, and a connection between said piston and a portion of the reversing mechanism of an engine.

2. The combination with the reverse lever of an engine, of a cylinder, a piston mounted in said cylinder, an operative connection between said lever and said piston, the cylinder being provided in its ends with inlet and exhaust ports, inlet and exhaust cocks secured in said inlet and exhaust ports and provided with plugs or valves, a connection between the plugs of the inlet cocks, the said plugs being connected with their ports at right angles to each other, a similar connection and arrangement between the valves or plugs of the exhaust cocks, and means for simultaneously actuating the inlet cocks and the exhaust cocks.

3. The combination with the reverse lever of an engine, of a cylinder, a piston mounted in said cylinder and provided at its ends with inlet ports and exhaust ports, a piston mounted to travel in said cylinder, an operative connection between said piston and the reverse lever, inlet cocks secured in the inlet ports and provided with plugs, arranged with their ports at right angles to each other, exhaust cocks secured in the exhaust ports of the cylinder, and provided with plugs or valves that are arranged with their ports at right angles to each other, a connection between the plugs of the inlet cocks, a connection between the plugs of the exhaust cocks, cranks extending from the plug of one inlet cock to the plug of one exhaust cock, an actuating rod connected to both of said cocks, and means for moving said rod.

4. The combination with the reverse lever of an engine, of a cylinder, a piston mounted in said cylinder and provided at its ends with inlet ports and exhaust ports, a piston mounted to travel in said cylinder, an operative connection between said piston and the reverse lever, inlet cocks secured in the inlet ports and provided with plugs, arranged with their ports at right angles to each other, exhaust cocks secured in the exhaust ports of the cylinder, and provided with plugs or valves that are arranged with their ports at right angles to each other, a connection between the plugs of the inlet cocks, a connection between the plugs of the exhaust cocks, cranks extending from the plug of one inlet cock to the plug of one exhaust cock, an actuating rod connected to both of said cocks, and means for moving said rod.

5. The combination with the reverse lever of an engine, of a cylinder, a piston mounted in said cylinder and provided at its ends with inlet ports and exhaust ports, a piston mounted to travel in said cylinder, an operative connection between said piston and the reverse lever, inlet cocks secured in the inlet ports and provided with plugs, arranged with their ports at right angles to each other, exhaust cocks secured in the exhaust ports of the cylinder, and provided with plugs or valves that are arranged with their ports at right angles to each other, a connection between the plugs of the inlet cocks, a connection between the plugs of the exhaust cocks, cranks extending from the plug of one inlet

cock to the plug of one exhaust cock, an actuating rod connected to both of said cranks a foot treadle connected to said actuating rod, and a support upon which said foot treadle is pivotally mounted.

5. The combination with the reverse lever of an engine, of a cylinder provided with inlet ports and exhaust ports, pistons mounted to travel in said cylinder, an operative connection between said piston and the reverse lever, inlet cocks secured in the inlet ports and provided with plugs arranged with their respective ports at right angles to each other, exhaust cocks secured in the exhaust ports of the cylinder and provided with plugs that are also arranged with their ports at

right angles to each other, the plug of one inlet cock being provided with a socket and the plug of one exhaust cock being provided with a socket, rods mounted at one end of the respective sockets and connected at their opposite ends, respectively, to the plugs of the opposite cocks, and a connection between said two last named plugs, said connections consisting of an actuating rod, and means for moving said rod.

In testimony whereof I affix my signature in presence of two witnesses.

COVERT R. SMITH.

Witnesses:

D. M. STARKEY,
J. F. McMATH.