

No. 810,422.

PATENTED JAN. 23, 1906.

G. LANE.  
ENGINE VALVE.

APPLICATION FILED SEPT. 21, 1904.

FIG. 1.

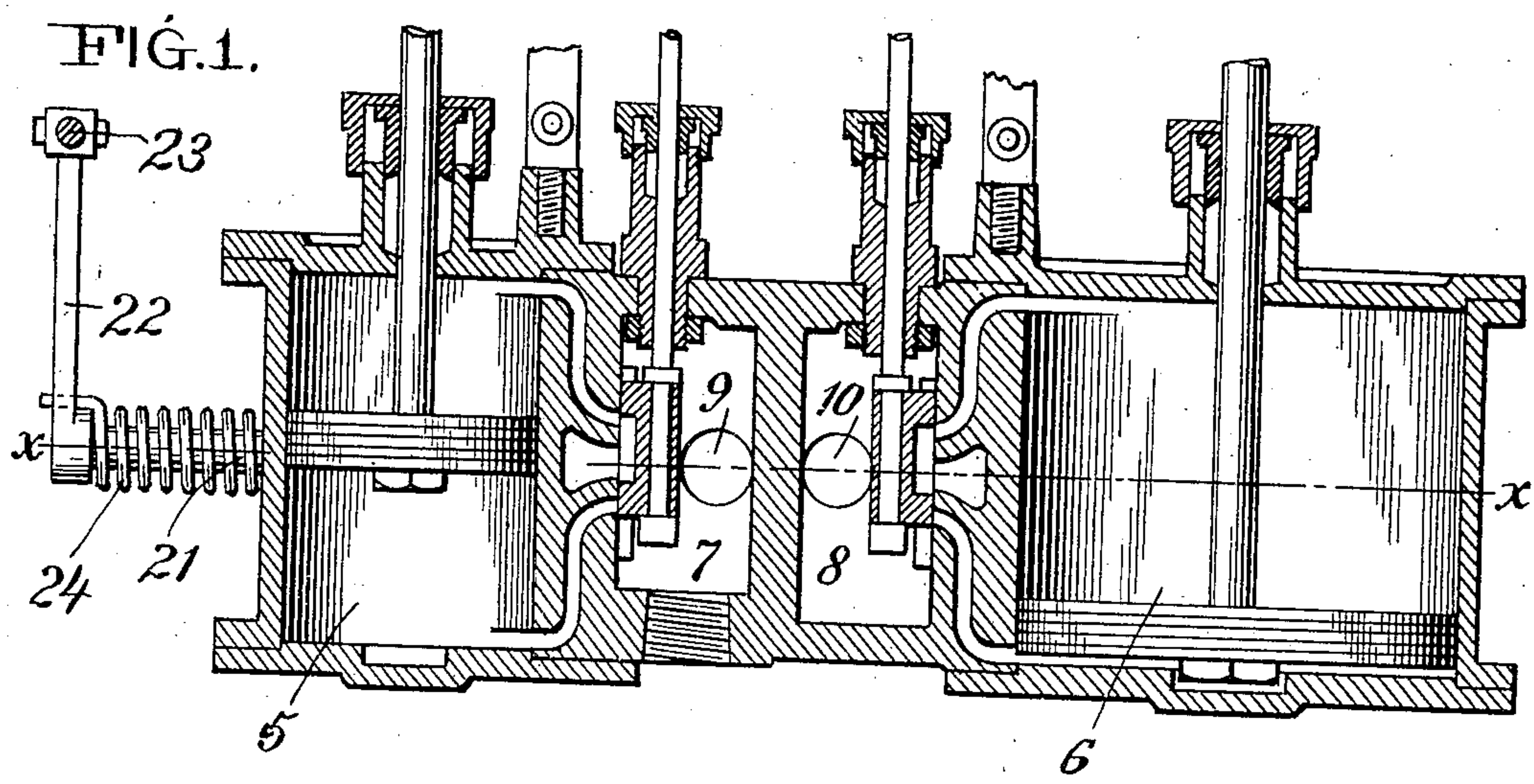


FIG. 2.

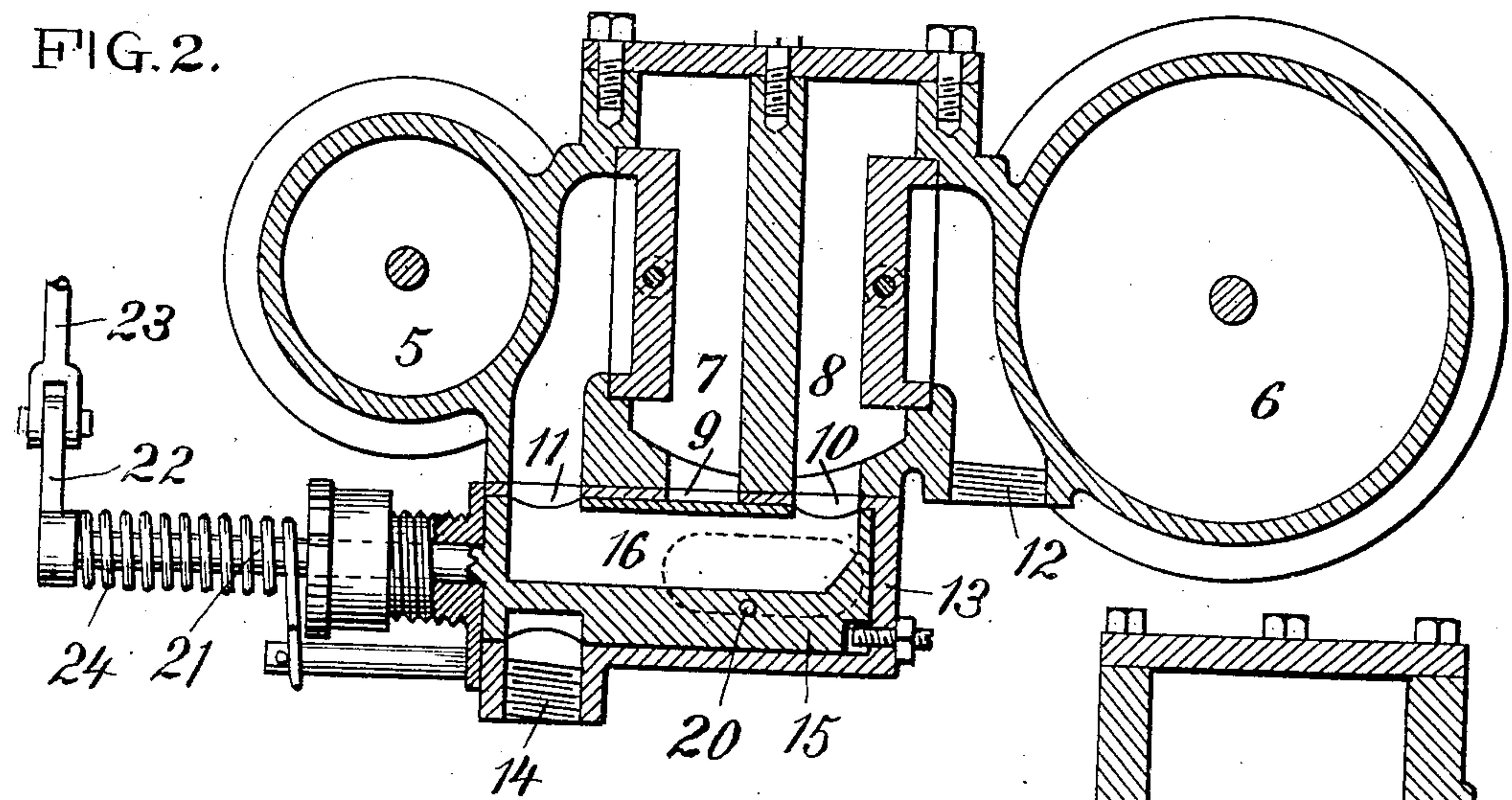


FIG. 4.

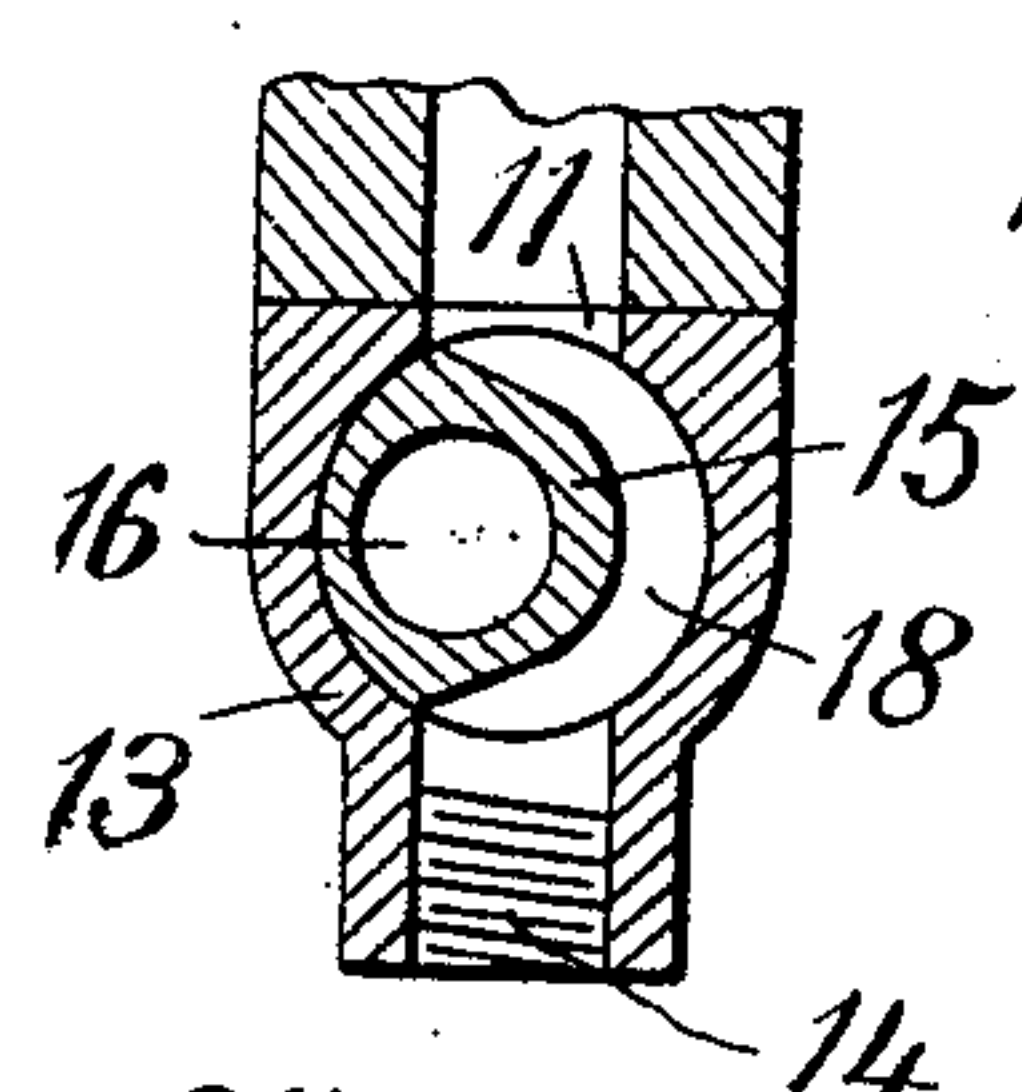


FIG. 3.

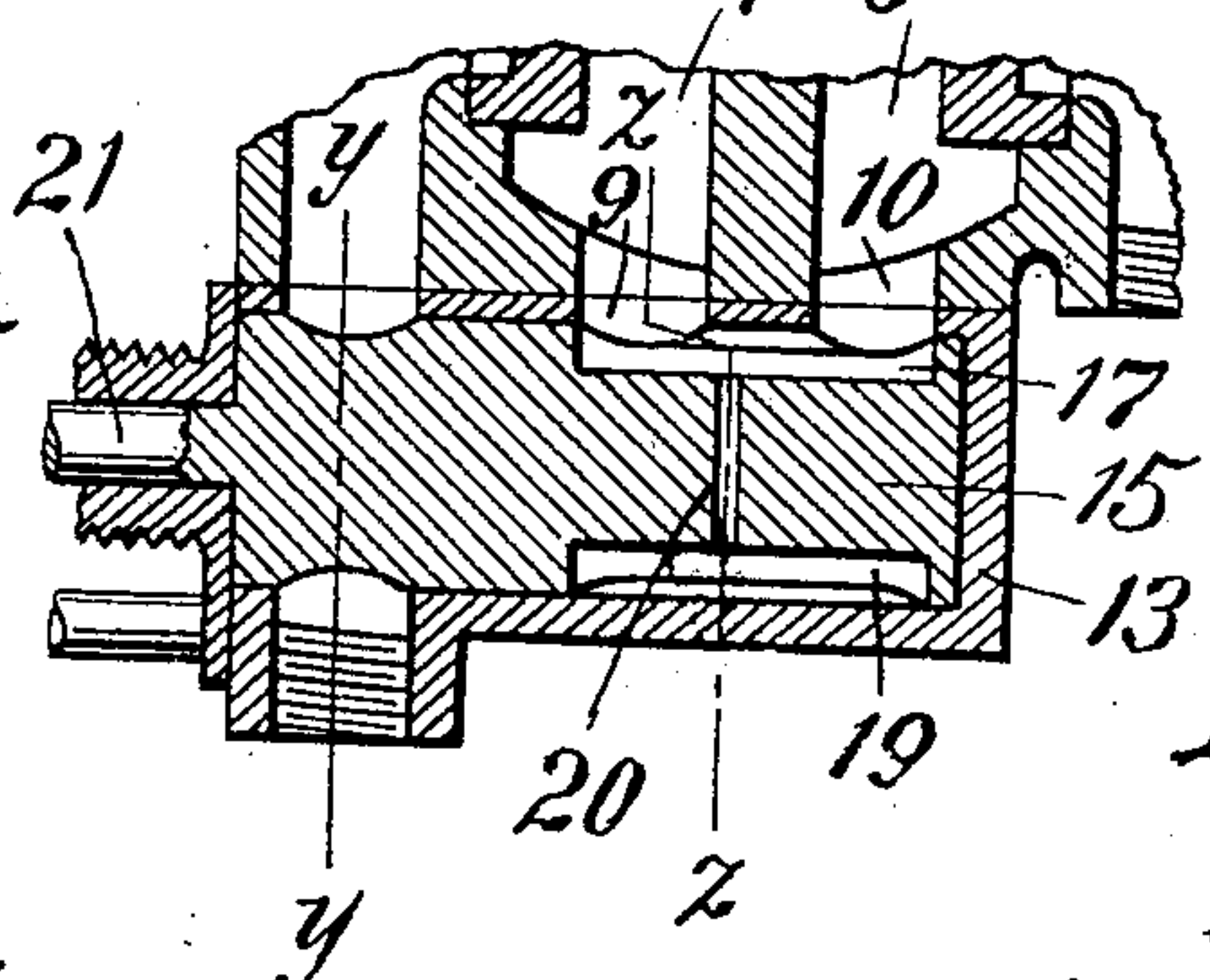
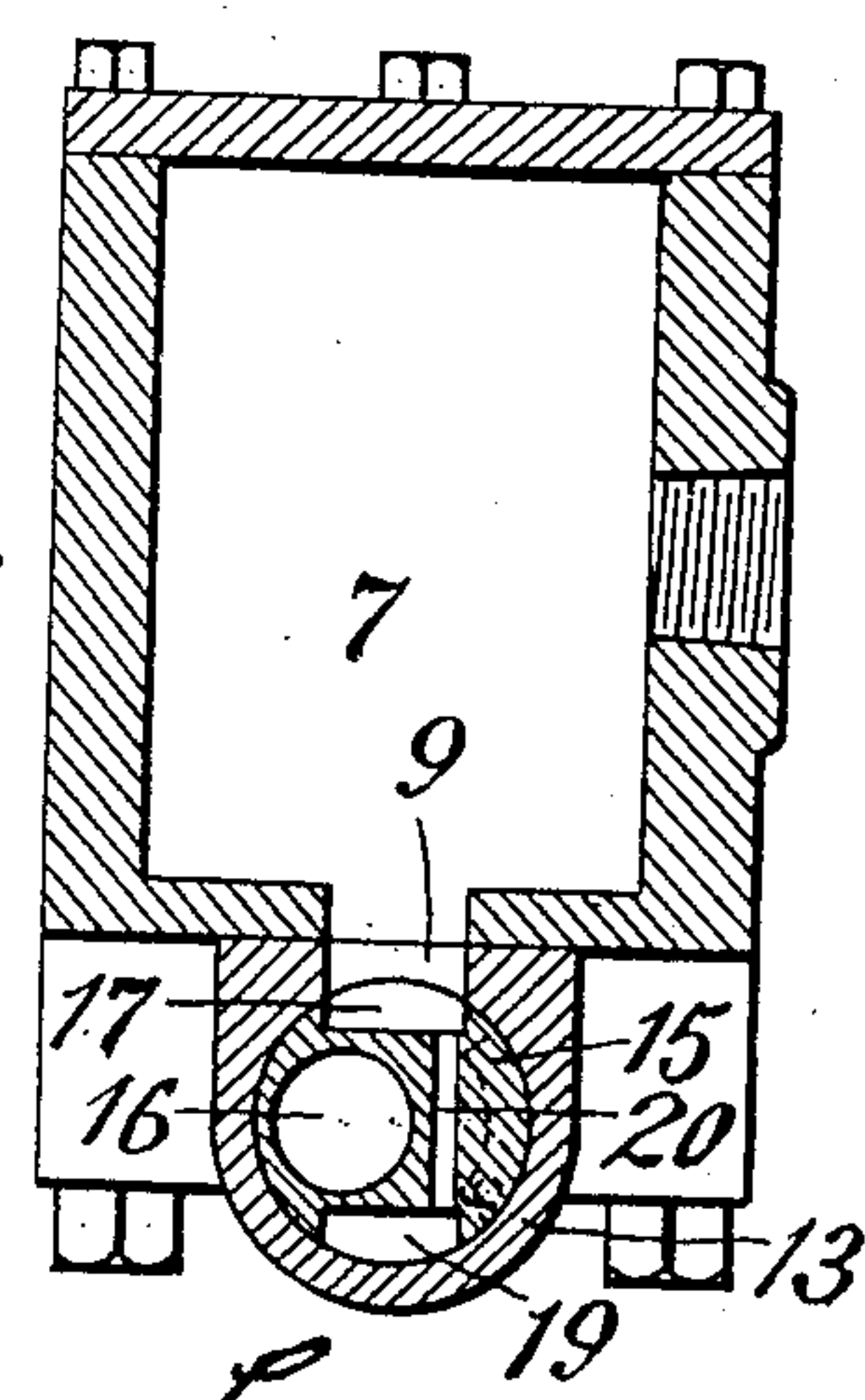


FIG. 5.



Witnesses  
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# UNITED STATES PATENT OFFICE.

GEORGE LANE, OF POUGHKEEPSIE, NEW YORK.

## ENGINE-VALVE.

No. 810,422.

Specification of Letters Patent.

Patented Jan. 23, 1906.

Application filed September 21, 1904. Serial No. 225,353.

*To all whom it may concern:*

Be it known that I, GEORGE LANE, a citizen of the United States, residing at Poughkeepsie, county of Dutchess, State of New York, have invented certain new and useful Improvements in Engine-Valves, of which the following is a specification.

My invention consists in a valve adapted to be used in connection with an engine having high and low pressure cylinders, and which has for its purpose to direct the steam fed to the engine either successively to the valve-chests of the high and low pressure cylinders in order that the engine may act as a compound engine or simultaneously to the valve-chests of both cylinders in order that the engine may act as a direct-acting engine.

My invention is especially applicable for use with engines on motor-cars, where it is desired to quickly increase the power of the engine—as, for instance, when climbing a hill or otherwise.

The accompanying drawings will serve to illustrate my invention, in which—

Figure 1 is a horizontal section taken through the high and low pressure cylinders and valve-chests of a compound engine and showing in plan at the left the valve-operating mechanism. Fig. 2 is a vertical section taken on the line X X of Fig. 1 through the high and low pressure cylinders and valve-chests and also through the controlling-valve with the valve-operating mechanism at the left in elevation. The valve in this figure is shown in the position it will occupy when the engine is used as a compound engine. Fig. 3 is a section corresponding to Fig. 2 and showing the valve in the position which it will occupy when the engine is used as a direct-acting engine. Fig. 4 is a vertical section taken on the line Y Y of Fig. 3. Fig. 5 is a vertical section taken on the line Z Z of Fig. 3.

In the drawings, 5 indicates a high-pressure cylinder, and 6 low-pressure cylinder, with their pistons; 7 8, valve-chests, with their slide-valves; 9 10, ports through which steam may be introduced into the valve-chests; 11, exhaust-port from high-pressure cylinder; 12, exhaust-port from low-pressure cylinder.

Situated at and connected to one side of the valve-chests is a casing 13, having an exhaust-port 14. The interior of this casing is cylindrical, and situated within the casing is a cylindrical valve 15. This valve is provided with a longitudinal passage 16, which

serves when in one position—i. e., in the position shown in Fig. 2—to connect the exhaust 11 from the high-pressure cylinder 5 with the valve-chest 8 of the low-pressure cylinder 6 and also with a longitudinal passage 17, which serves when the valve is in another position—i. e., in the position shown in Fig. 3—to connect the steam-ports 9 10 with the valve-chests 7 8 and, further, with the circumferential passage 18, (best shown in Fig. 4,) which serves to connect the exhaust-port 11 from the high-pressure cylinder with the exhaust-port 14 in the casing.

The valve 15 is balanced by means of the steam-space 19 in communication with the passage 17 through the passage 20.

Connected to one end of the valve 15 is a stem 21, and on the end of the stem is an arm 22, connected to a lever 23, which in a motor-carriage leads upward into the body of the vehicle, so as to be readily controlled by the driver.

24 is a helical spring surrounding the stem 21 and arranged to normally hold the valve 15 in the position shown in Fig. 2—that is, in the position in which the engine will act as a compound engine.

The operation of the valve will be readily understood. The valve 15 normally occupies the position shown in Fig. 2. When the driver of the motor-car wishes to change the power of the engine, he operates the lever 23, which, through the arm 22 and stem 21, effects the partial rotation of the valve 15, moving the valve to the position shown in Fig. 3, when both cylinders of the engine become direct-acting, and holds the lever in such position until the requirement for increased power is past. He then releases the lever, whereupon the spring 24 rotates the valve 15 to its original position.

The general shape and arrangement of valve 15 relative to the high and low pressure cylinders is that which I have found most convenient in practice. I, however, do not limit myself to the specific form or arrangement of valve described, as it may be varied.

Having thus described my invention, I claim—

1. In a steam-engine, the combination of the high and the low pressure cylinders and slide-valves therefor, a single rotary valve cooperating therewith, automatic means for moving said valve to one position, and manual means for moving said valve to a second position.



2. In combination with the high and low pressure cylinders of a steam-engine and their valve-chests, a casing having a port communicating with the high-pressure exhaust, ports communicating with the respective valve-chests, an exhaust-port to the atmosphere; a valve in said casing having a longitudinal passage communicating when in one position with the high-pressure exhaust and the low-pressure valve-chest, and passages which when the valve is in another position respectively communicate between the high and low pressure valve-chests and between the high-pressure exhaust and the atmosphere.

3. In a steam-engine, the combination of the high and low pressure cylinders, a single rotary balanced valve interposed between the cylinders and having requisite ports and passages to connect the cylinders in either direct or compound relation with the high-pressure steam, manual means for shifting the valve, and automatic means acting to return the valve to its normal position.

4. In a steam-engine, the combination of the high and the low pressure cylinders and slide-valves therefor, a single rotary valve co-operating therewith and having requisite ports and passages to connect the cylinders in either direct or compound relation with the high-pressure steam, a lever for moving the valve to one position and a spring for automatically moving the valve to a second position.

5. In a steam-engine, the combination of the high and the low pressure cylinders, slide-valves therefor, a single rotary valve co-operating with the slide-valve for changing the engine from compound to direct acting, together with means for manually actuating the rotary valve to make such change and au-

tomatically restoring said valve to its original position.

6. In combination with the high and low pressure cylinders of a steam-engine and their valve-chests, a casing attached thereto having a cylindrical interior and ports communicating respectively with the high-pressure exhaust, the valve-chests, and the atmosphere; a rotary valve in said casing having passages therein, one of said passages adapted to communicate between the high-pressure exhaust and the low-pressure valve-chest, another of said passages with the high and low pressure valve-chests and the source of steam, and the third between the high-pressure exhaust and the atmosphere.

7. In combination with the high and low pressure cylinders of a steam-engine and their valve-chests, a casing attached thereto and having a cylindrical interior with ports respectively communicating with the high-pressure exhaust, high and low pressure valve-chests and the atmosphere; a rotary valve in said casing provided with passages adapted to communicate between the high-pressure exhaust and the low-pressure cylinder, or between the source of steam and the high and low pressure valve-chests, and between the high-pressure exhaust and the atmosphere, together with means for throwing the first or second and third of said passages in said valve, into position to cause the engine to act as a compound or direct-acting engine as desired.

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

GEORGE LANE.

Witnesses:

J. M. JANES,  
SILAS LANE.