

No. 679,099.

Patented July 23, 1901.

R. L. WRIGHTON & D. B. MORISON.

STEAM DISTRIBUTING VALVE FOR MULTIPLE EXPANSION ENGINES.

(Application filed Dec. 3, 1900.)

(No Model.)

4 Sheets—Sheet 1.

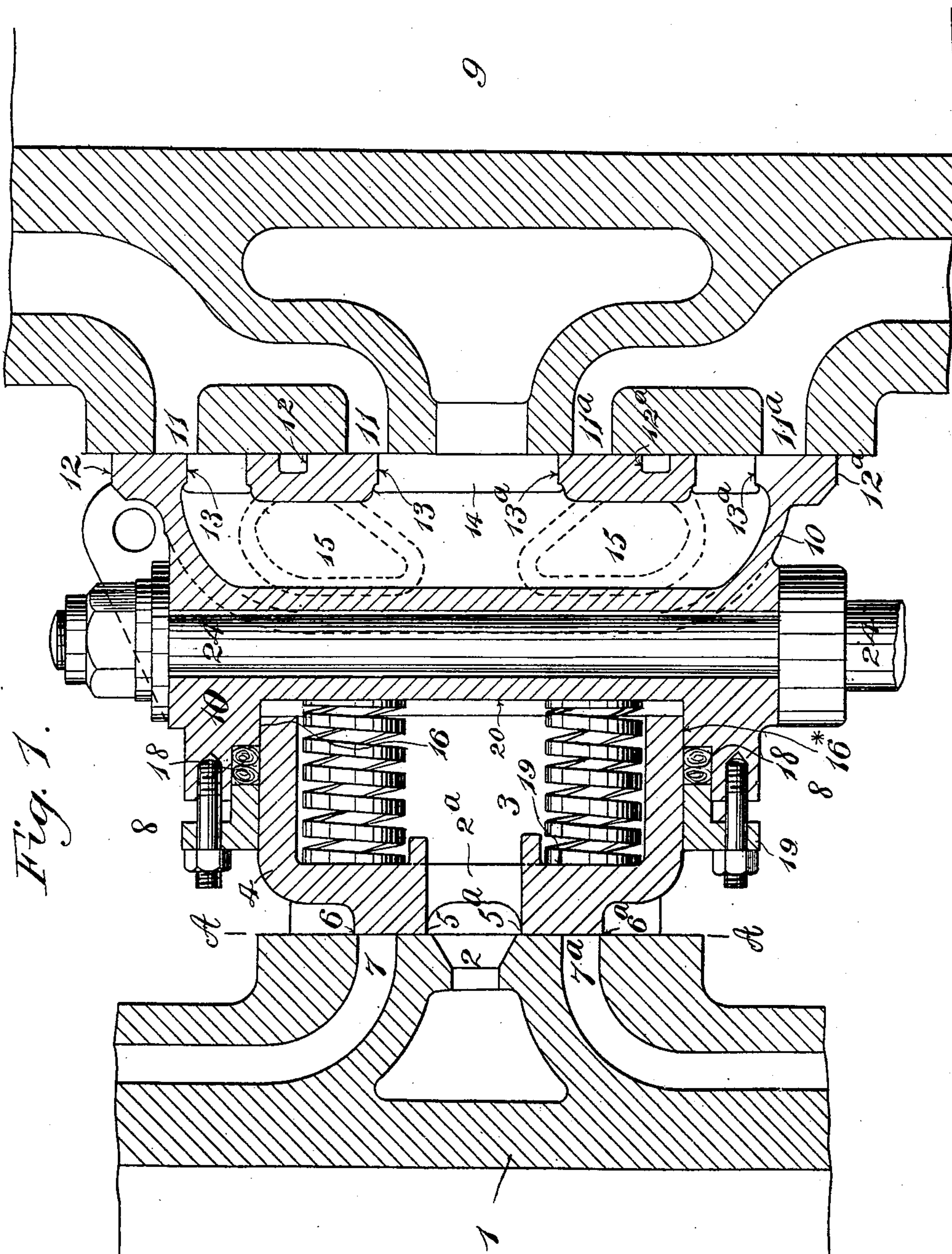


Fig. 1.

Witnesses.

Geo. E. Trech.
Chas. R. Wright.

Inventors

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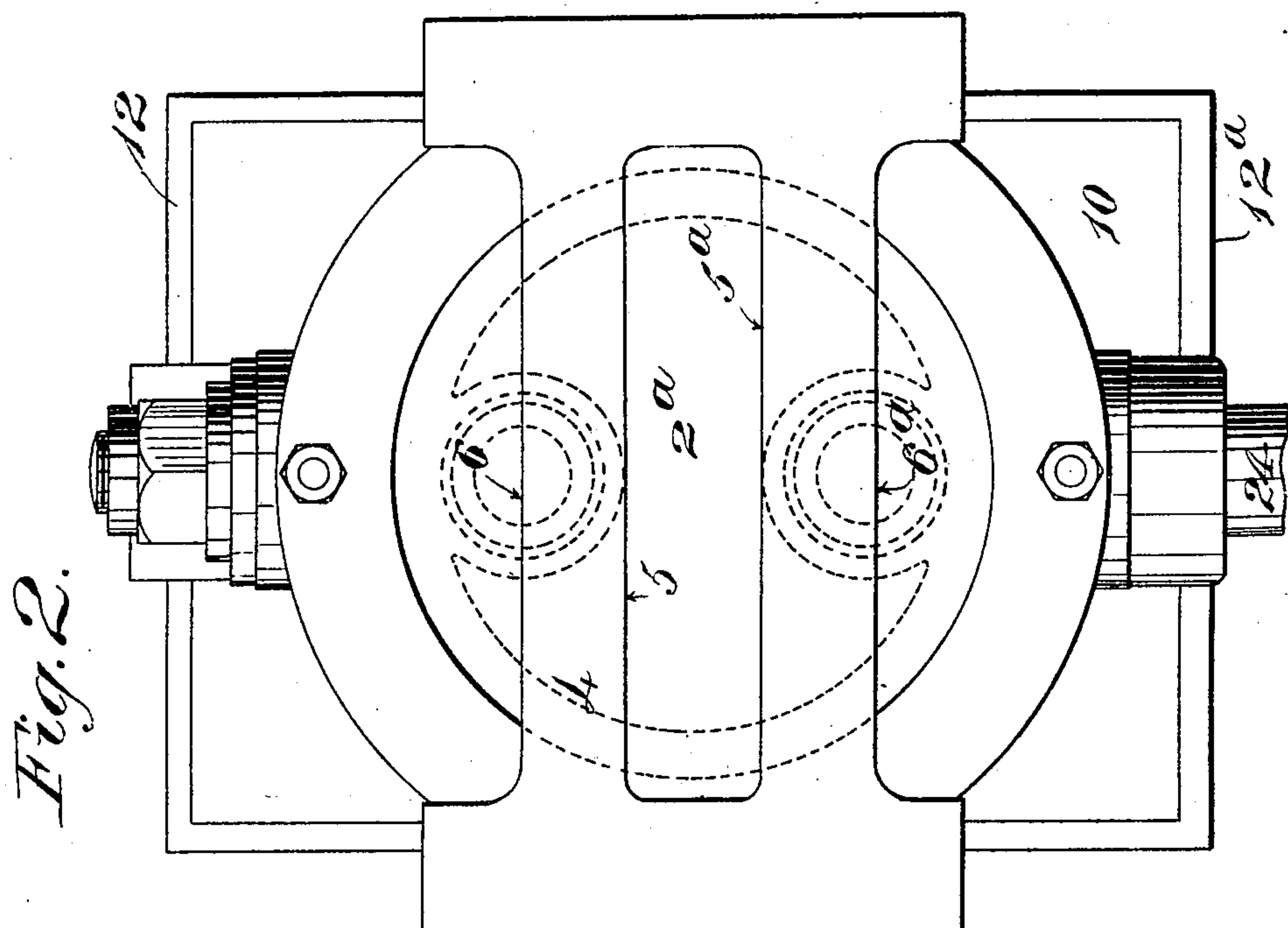
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4 Sheets—Sheet 3.

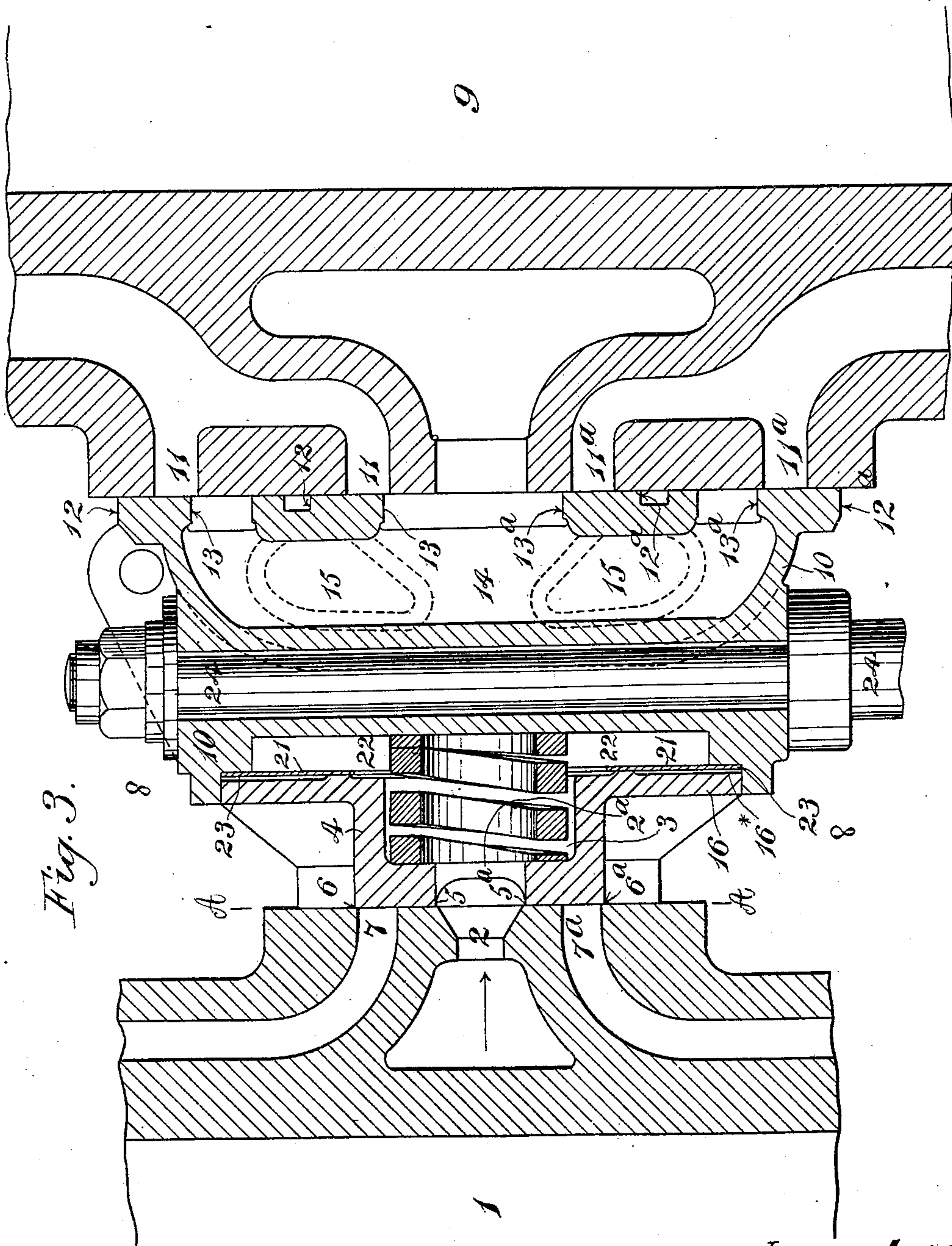


Fig. 3.

Witnesses.

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D. B. Morison,
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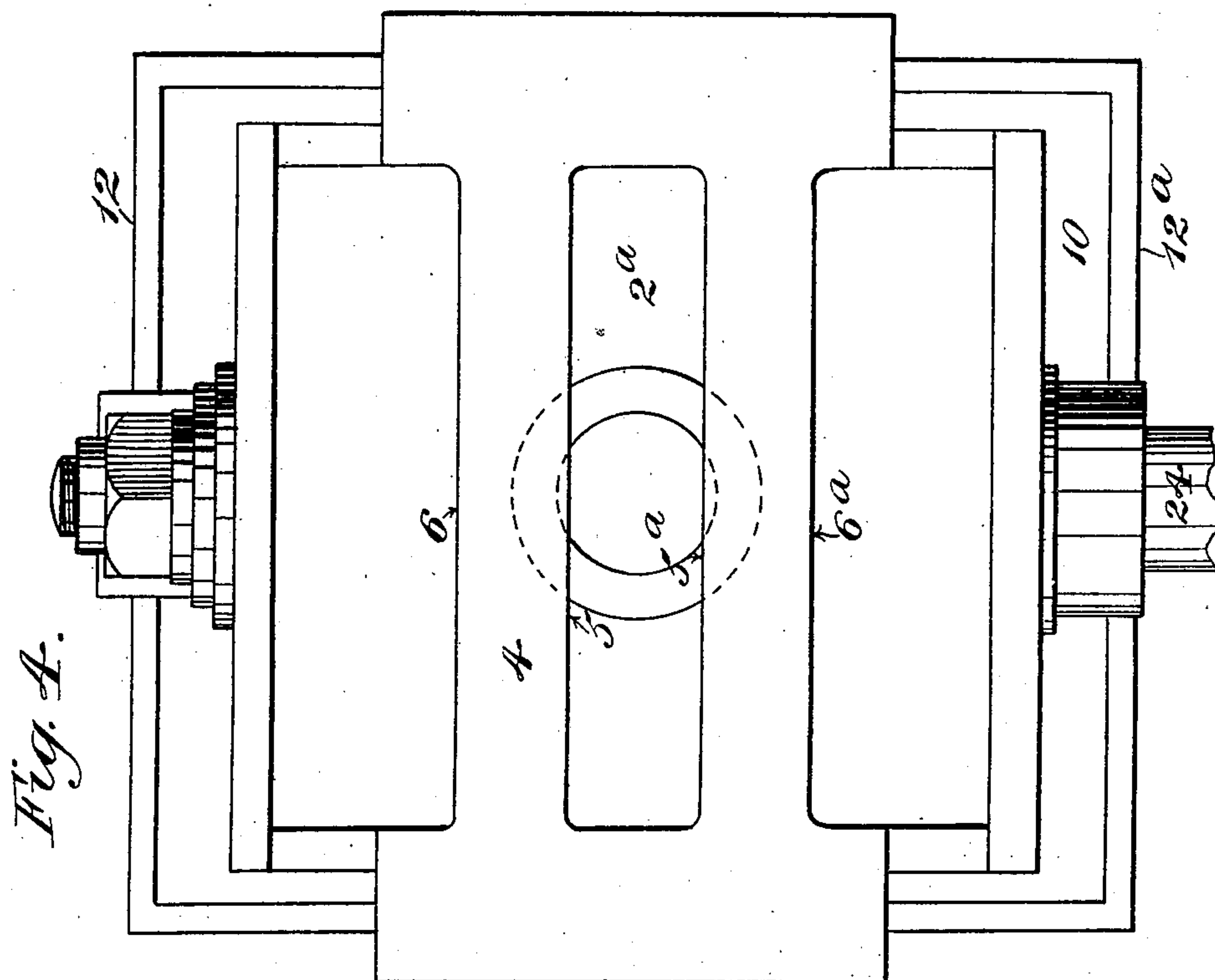
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(No Model.)

4 Sheets—Sheet 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

ROBERT LUNAN WEIGHTON, OF NEWCASTLE-UPON-TYNE, AND DONALD
BARNES MORISON, OF HARTLEPOOL, ENGLAND.

STEAM-DISTRIBUTING VALVE FOR MULTIPLE-EXPANSION ENGINES.

SPECIFICATION forming part of Letters Patent No. 679,099, dated July 23, 1901.

Application filed December 3, 1900. Serial No. 38,636. (No model.)

To all whom it may concern:

Be it known that we, ROBERT LUNAN WEIGHTON, of Newcastle-upon-Tyne, in the county of Northumberland, and DONALD BARNES MORISON, of Hartlepool, in the county of Durham, England, subjects of the Queen of Great Britain and Ireland, have invented Improvements in Steam-Distributing Valves of Multiple-Expansion Engines, of which the following is a specification.

This invention has reference to improvements in the steam-distributing valves of any two adjacent cylinders of multiple-expansion engines, in which the piston-rods of the said cylinders are connected to separate cranks and the said valves are arranged back to back and move together, as when driven by one set of valve-gear.

Referring to the accompanying illustrative drawings, Figure 1 shows a section of a pair of valves according to this invention; and Fig. 2, a section on the line A A, Fig. 1. Figs. 3 and 4 are corresponding views to Figs. 1 and 2 of a modified construction.

The supply-steam for the first cylinder 1 is admitted through the passage 2 and port 2^a to the central portion 3 of its valve 4, of which the inside edges 5 5^a regulate the admission and cut off and the outside edges 6 6^a the release and compression.

The steam, after doing duty in the cylinder 1, exhausts through the passages 7 7^a, past the edges 6 6^a of the valve 4 into a chamber or receiver 8, whence it passes to the adjacent cylinder 9, the distribution of steam to and from which is controlled by a double-ported valve 10, arranged reversely to the valve 4, steam entering the cylinder 9 through the passages 11 11^a, so that the outside edges 12 12^a of the valve 10 regulate the admission and cut off and the inside edges 13 13^a the release and compression. The exhaust takes place through the passage 14 in the valve 10 and the exhaust-passage 15. The slide-valves 4 and 10, which are arranged back to back, are connected so that they slide to and fro together, but are capable of moving away from each other toward their seats.

In the arrangement shown in Figs. 1 and 2 a hollow cylindrical part 16 of the valve 4

fits into a corresponding recess 16^x in the back of the valve 10, said recess being in communication with the central portion 3 of the valve 4 and being formed with a stuffing-box 18, provided with a gland 19, so as to prevent the escape of steam into the chamber 8. The high-pressure steam thus acts on the surfaces 19 and 20 of the respective valves 4 and 10 and tends to force them apart. These surfaces are so proportioned and arranged that the steam-pressure load on the back of the valve 4 will be so much greater than the load on its face that it will be kept on its seat. The load on the back of valve 10 is increased to a corresponding extent; but since this valve has a larger surface area and works at a lower temperature than the valve 4 this additional load will not in practice materially affect the efficient working of the valve 10.

In the arrangement shown in Figs. 3 and 4 the valve 4 is formed with a back portion 16 of rectangular or other convenient form adapted to fit into a corresponding recess 16^x in the valve 10, and the joint between the two valves is made steam-tight by means of a flexible diaphragm 21, attached in steam-tight manner to the valve 4 at 22 and to the valve 10 at 23. The two valves 4 and 10 are in both the arrangements illustrated actuated through a single spindle 24, to which the valve 10 is secured. To assist in retaining the valves on their seats, springs or other suitable means may be used if found desirable.

What we claim is—

1. The combination of two consecutive cylinders of a multiple-expansion engine having inlet and exhaust passages, a steam chamber or receiver arranged between said cylinders, two slide-valves arranged back to back in said receiver and adapted to control said inlet and exhaust passages, a connection between said valves to cause them to move to and fro together but to leave them free to move apart toward their seats, one of said valves being adapted to admit high-pressure steam through its central portion to the cylinder controlled thereby and to exhaust past its ends into said receiver and the other to admit steam past its ends to its cylinder and to exhaust through its central portion, and a space between said

valves in communication with the central portion of the first-mentioned valve, substantially as described.

2. The combination of two consecutive cylinders of a multiple-expansion engine having inlet and exhaust passages, a steam chamber or receiver arranged between the cylinders, two slide-valves arranged back to back in said receiver and adapted to control said inlet and exhaust passages, a connection between said valves to cause them to move to and fro together but to leave them free to move apart toward their seats, one of said valves being adapted to admit high-pressure steam through its central portion to the cylinder controlled thereby and to exhaust past its ends into said receiver and the other to admit steam past its ends to its cylinder and to exhaust through its central portion, and a projection on the back of one of said valves fitting a recess in the other which recess is in communication with the central portion of the first-mentioned valve, substantially as described.

3. The combination of two consecutive cylinders of a multiple-expansion engine having inlet and exhaust passages, a steam chamber

or receiver arranged between said cylinders, two slide-valves arranged back to back in said receiver and adapted to control said inlet and exhaust passages, a connection between said valves adapted to cause them to move to and fro together but to leave them free to move apart toward their seats, one of said valves being single-ported and adapted to admit high-pressure steam through its central portion to the cylinder controlled thereby and to exhaust past its ends into the receiver and the other being multiple-ported and adapted to admit steam past its ends to the cylinder controlled thereby and to exhaust through its central portion, and a space between said valves in communication with a high-pressure steam-supply, substantially as described.

Signed at West Hartlepool by DONALD BARNES MORISON on the 9th day of November, 1900, and by ROBERT LUNAN WEIGHTON this 10th day of November, 1900.

ROBERT LUNAN WEIGHTON.
DONALD BARNES MORISON.

Witnesses:

T. HARRY TILLY,
T. HARRY TILLY, Jr.