(No Model.) 2 Sheets—Sheet 1.

J. W. SARGENT.

STEAM ENGINE.

No. 502,763. Patented Aug. 8, 1893.

Fig. 1.

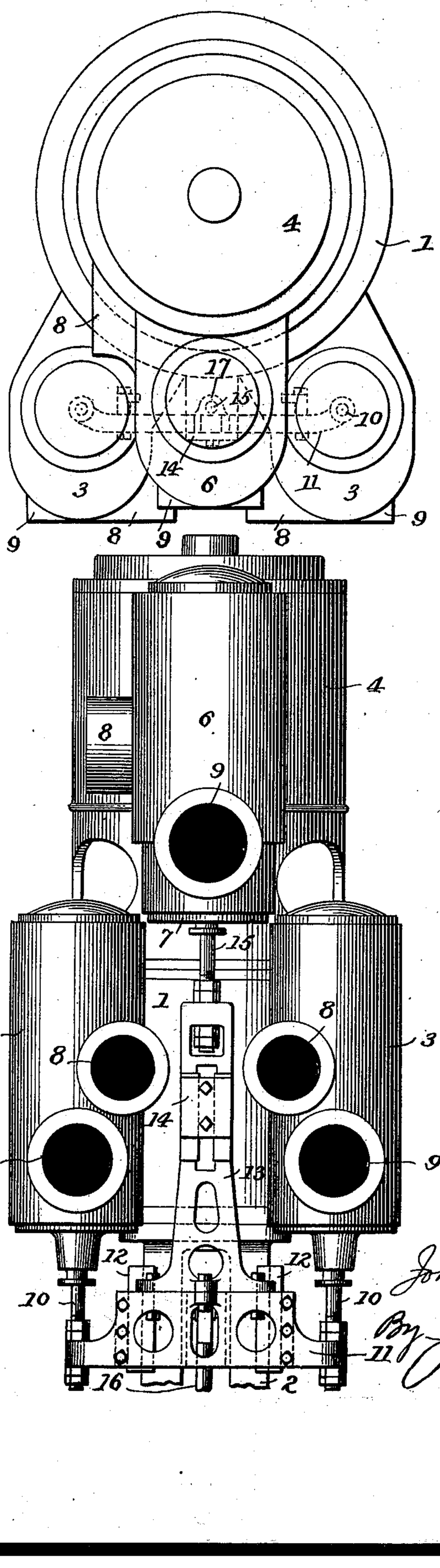

Fig. 2.

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(No Model.)

2 Sheets—Sheet 2.

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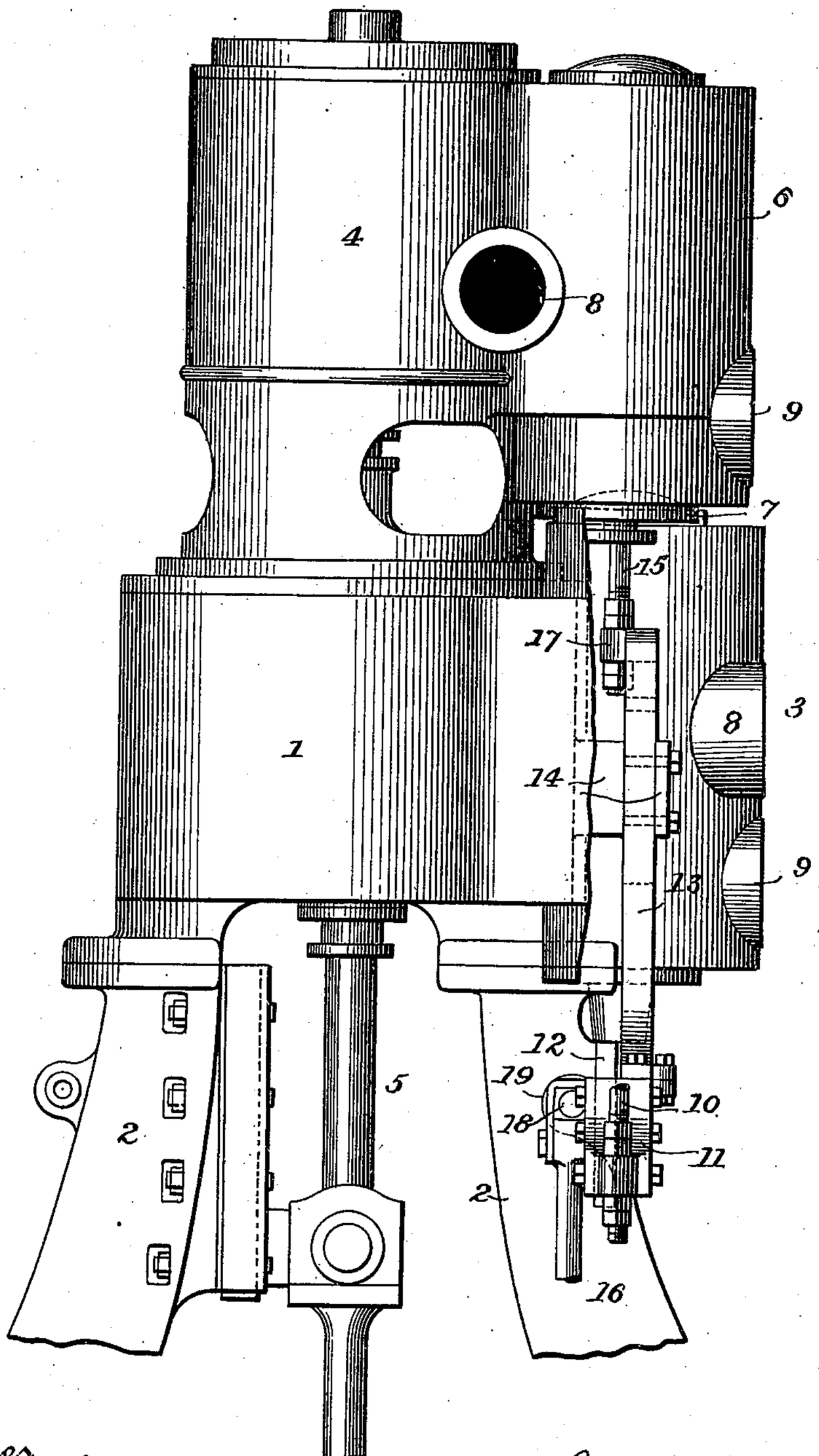
Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN W. SARGENT, OF SCRANTON, PENNSYLVANIA.

STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 502,763, dated August 8, 1893.

Application filed April 13, 1893. Serial No. 470,223. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. SARGENT, a citizen of the United States, residing at Scranton, in the county of Lackawanna and State of Pennsylvania, have invented certain new and useful Improvements in Steam-Engines, of which the following is a specification.

My invention relates to an improvement in steam engines and it consists in a novel and convenient arrangement of the valves and valve connections upon a compound engine in which the cylinders are arranged tandem.

The objects of the invention are to arrange the cylinders and steam chests as compactly as possible and at the same time to provide for the ready removal of the steam chest heads or bonnets so that the valves may be easily inspected or taken out for repairs; and furthermore to operate the valve and steam chests of a tandem engine from a single crosshead.

In the accompanying drawings, Figure 1 is a plan view of part of a vertical engine embodying my invention. Fig. 2 is a front elevation of the same, and Fig. 3 is a side elevation, one of the steam chests being broken away to show the crosshead and its connections.

In the drawings I have shown a pair of cylinders, arranged tandem, with their steam chests and so much of the engine as is necessary to illustrate my present invention. These cylinders may constitute a part of an ordinary compound engine or they may be used as two of the cylinders of a triple or quadruple expansion engine, the particular variety of engine being immaterial so far as the present invention is concerned.

As shown 1 indicates a low pressure cylinder which rests directly upon the column 2 of the engine frame and is provided with a pair of piston valves inclosed in steam chests 3—3. The high pressure cylinder 4 is directly above and in line with the low pressure cylinder. The steam chests 3—3 of the low pressure or double-valved cylinder are separated from each other a distance about equal to the width of the steam chest 6 of the high pressure or single-valved cylinder so as to permit of the removal of the lower bonnet 7 of the latter steam chest.

The reference signs 8 and 9 indicate respectively the inlet and outlet ports of the several steam chests.

The valve stems 10 of the low pressure valves are connected to the extremities of a crosshead 11 which slides upon guides 12 upon the column 2. This crosshead is provided centrally with an arm 13 which extends upward between the steam chests 3—3 and runs upon a guideway 14 attached to the low pressure cylinder. To the upper end of the arm 13 is connected the valve stem 15 of the high pressure cylinder. The crosshead 11 is operated by a link 16 the lower end of which is connected with the valve gear. The valve stem crosshead, including its vertical arm, is of an inverted T-shape and the guides upon which it runs are arranged at the apices of a triangle, thus giving the crosshead a smooth and steady movement without undue strain upon any of the parts. The three valve chests when arranged as described permit the upper and lower bonnets of either of them to be removed without interference from the others; and by providing the low pressure cylinder with two steam chests the large volume of expanded steam is permitted to enter the cylinder unimpeded, the engine is rendered more compact and shapely than if a single steam chest were used, and provision is made for a direct connection between the crosshead and the stem of the high pressure valve, which connection is directly in line with the link operating the crosshead. As shown the arm 14 is bolted to the main crosshead 11, but it will be evident that if desired they may be cast in a single piece. The valve stem 15 is connected to a lug 17 at the rear of the arm 13, and the link 16 is connected by a pin 18 to lugs 19 upon the rear of the crosshead 11. These and other details of construction may however be varied to suit any particular requirements without departing from the spirit of my invention.

What I claim, and desire to secure by Letters Patent, is—

1. In a steam engine the combination of a double-valved cylinder and a single-valved cylinder arranged tandem, the steam chests of the former cylinder being separated and arranged with the space between them opposite the steam chest of the latter cylinder,

and a single crosshead to which each of the valve stems of said cylinders is connected, substantially as described.

2. In a steam engine the combination of a double-valved cylinder and a single-valved cylinder arranged tandem, the steam chests of the former cylinder being separated and arranged with the space between them opposite the steam chest of the latter cylinder, and a crosshead having its extremities connected to the valve-stems of the double-valved cylinder and a central arm extending between the steam chests of said cylinder and connected to the valve stem of the single-valved cylinder, substantially as described.

3. In a steam engine the combination of a double-valved cylinder and a single-valved cylinder arranged tandem, the steam chests of the former cylinder being separated and arranged with the space between them opposite the steam chest of the latter cylinder, and a crosshead having a central arm arranged between the steam chests, of a double-valved cylinder, the said crosshead being provided with guides 12 and a guide 14 for the arm, substantially as described.

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

JOHN W. SARGENT.

Witnesses:
JAS. H. TORREY,
C. A. BATTENBERG.