

(No Model.)

2 Sheets—Sheet 1.

W. H. OHMEN.
COMPOUND STEAM ENGINE.

No. 474,757.

Patented May 10, 1892.

Fig. 1.

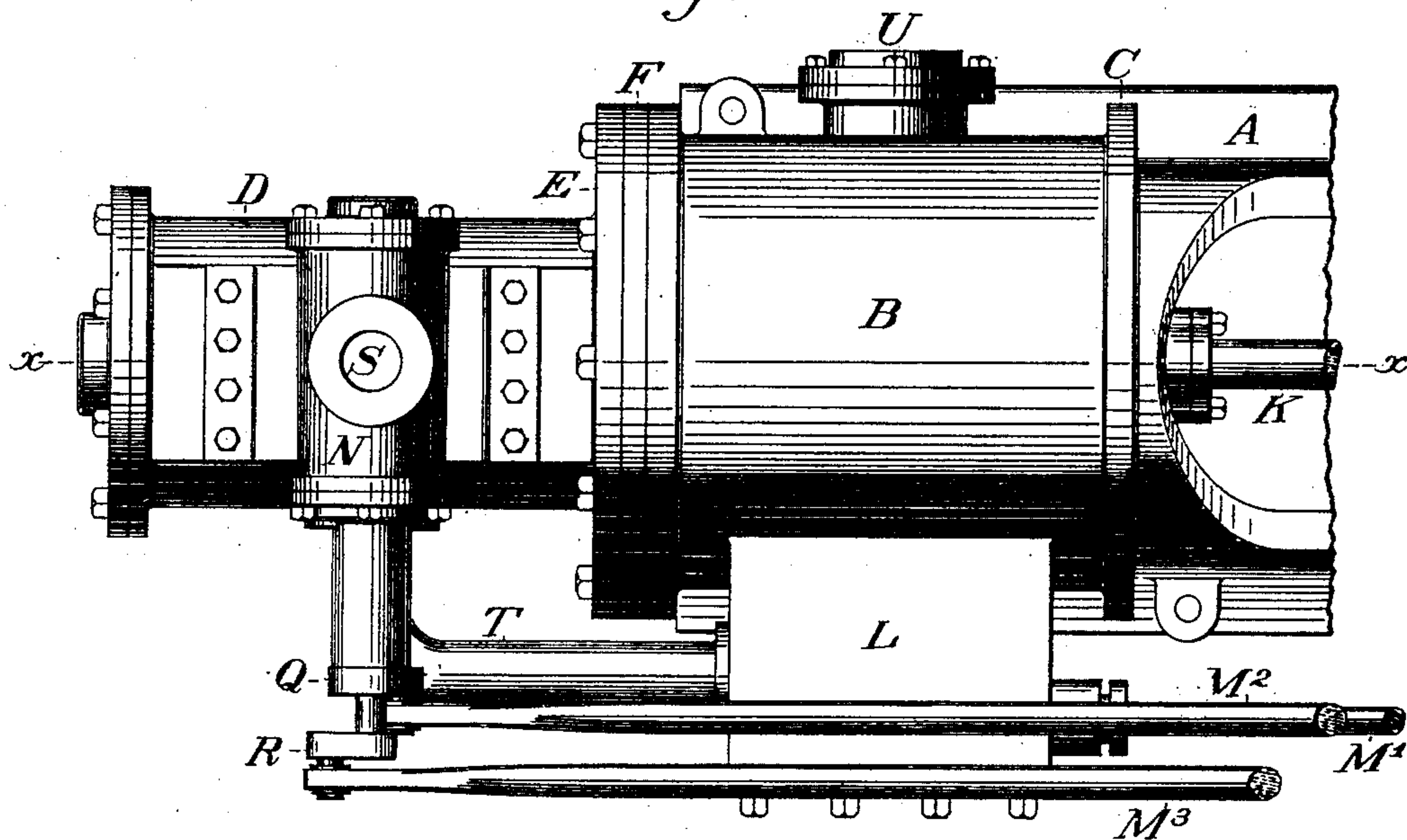
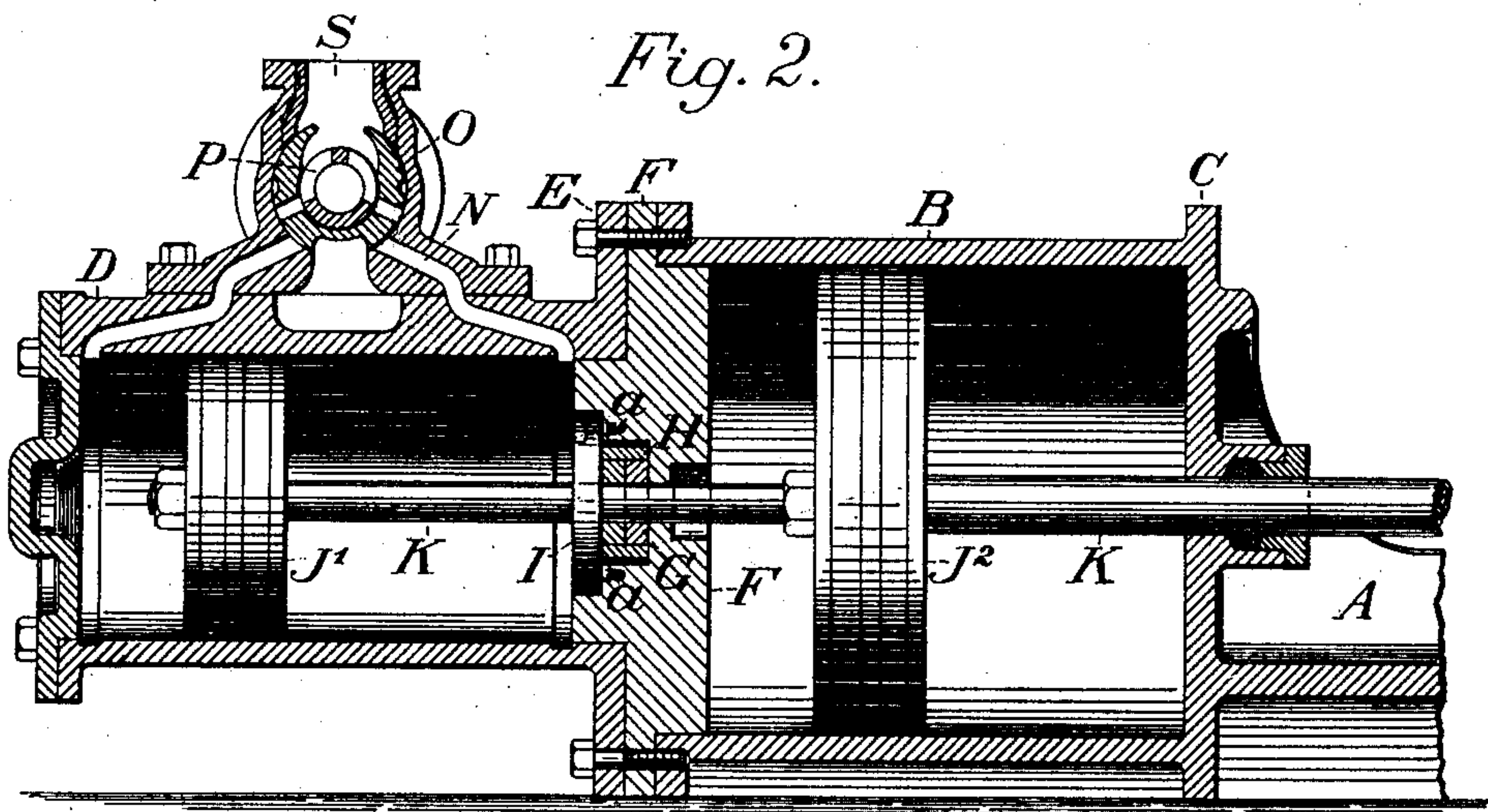


Fig. 2.

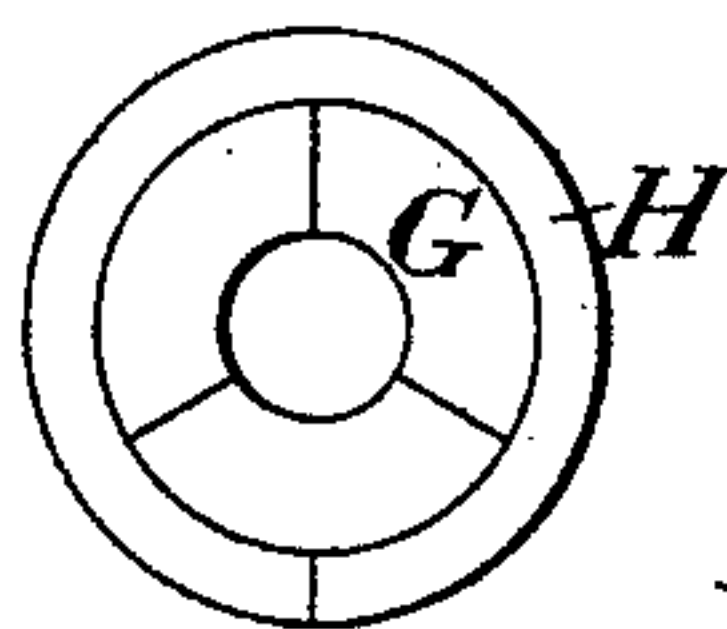


Witnesses:

E. A. Brandau.

W. D. Bent, Jr.

Fig. 3.



Inventor:

William H. Ohmen
By his atty
John Richards

(No Model.)

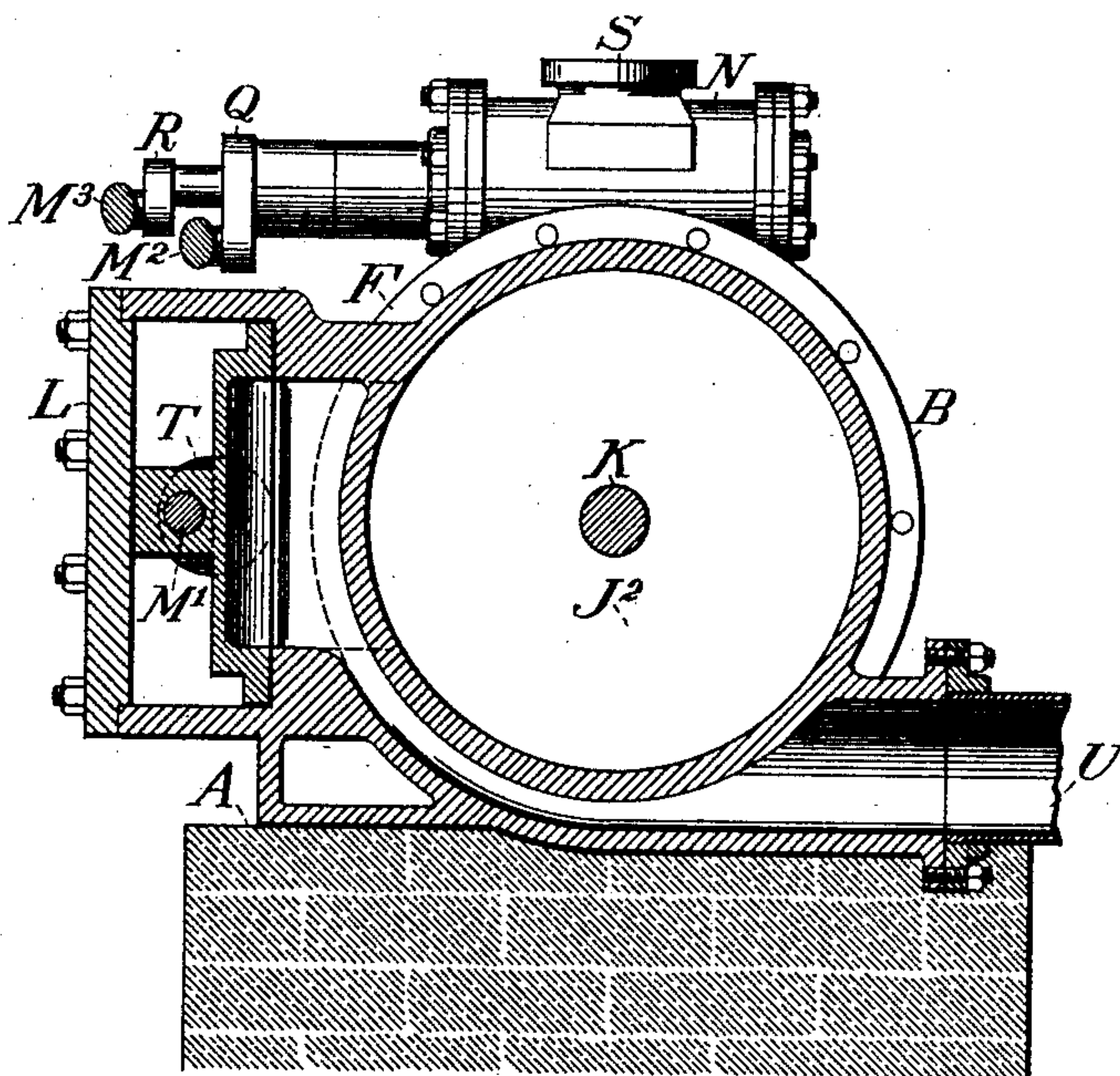
2 Sheets—Sheet 2.

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Fig. 4.



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Inventor:

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UNITED STATES PATENT OFFICE.

WILLIAM H. OHMEN, OF SAN FRANCISCO, CALIFORNIA.

COMPOUND STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 474,757, dated May 10, 1892.

Application filed July 27, 1891. Serial No. 400,854. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. OHMEN, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Compound Steam-Engines; and I hereby declare the following specification and drawings, forming a part thereof, to constitute a full, clear, and exact description of my invention.

My invention relates to what are known as "compound steam-engines" having two cylinders of different capacity or size and to that class wherein these cylinders are set in one line with a single piston-rod passing through both cylinders; and it consists in a combination, with these cylinders, of a slide-valve and a special oscillating valve described in certain Letters Patent hereinafter specifically referred to, and in joining the cylinders close together by their ends with a packing-gland between, so that the valve connections may pass in a direct line through different planes and not interfere one with the other.

Referring to the drawings illustrating my invention, Figure 1 is a plan view of the cylinders and details connected therewith of a compound steam-engine constructed according to my invention. Fig. 2 is a longitudinal section through the same cylinders, showing the nature of the steam-valves employed on the initial cylinder, the manner of connecting the cylinders together, and also the method of packing the piston-rod between the cylinders. Fig. 3 is a side view of the packing-rings around the piston-rod between the cylinders; and Fig. 4 is a vertical transverse section of the engine through the cylinder and valve-box, looking toward oscillating valves.

Similar letters of reference are employed on the figures to indicate corresponding parts of the engine.

The main frame of the engine A is formed integrally with the second or expansion cylinder B, or the latter can, if required, be bolted on at the flange C, if that method is preferred.

The initial or high-pressure cylinder D is joined to the low-pressure cylinder B by the flange E by a single intermediate flanged separate head or diaphragm-plate F, which is

interposed between the two cylinders. In this head or diaphragm-plate F is provided a packing-gland composed of members G, H, and I, as shown in Figs. 2 and 3 of the drawings.

The engine-pistons J' and J² are of the usual construction, both attached to the same piston-rod K, as shown in Fig. 2.

The expansion-cylinder B is provided with a common slide-valve contained in the valve-box L, Fig. 1, and operated by the valve-rod M'.

The initial or high-pressure cylinder D is provided with oscillating valves P and O, forming the subject of Letters Patent on cut-off valves, No. 305,718, granted to J. P. Simmons, and to myself as assignee of one-half interest therein, dated September 23, 1884. These valves are contained in the chamber N, as shown in section in Fig. 2, O being the main distributing-valve, and P a cut-off one for regulating the admission of initial steam and the speed and power of the engine. The action of the valve P is controlled by means of a centrifugal governor that determines the time of its closing in the usual manner of cut-off engines. The valves O and P are operated by cranks Q and R and valve-rods M² and M³, the latter passing over the top of the valve-box L, as shown in Fig. 1. Steam enters at S, and after acting in the cylinder D passes through the pipe T to the expansion-cylinder B, after which it escapes at the nozzle U.

Referring to the packing between the cylinders B and D and around the piston-rod K, the inner ring G is split into three or more parts, as shown in Fig. 3, and around this is placed the spring-ring H, which is split on one side and so made as to maintain a constant tension on the inner ring G, thus forming a steam-tight joint around the piston-rod K. To prevent steam from passing around the rings H and G, their ends are ground accurately to fit against the bottom of the recess in the diaphragm-plate F and the covering-plate I, permitting, however, lateral movement of the packing to accommodate any deviation of alignment in the piston-rod K, thus forming what is called a "floating packing."

The plate I is fastened by means of screws a a, so that the packing can be taken out

through the initial cylinder D when the piston J' is removed for that purpose.

It will be observed that by employing oscillating valves O and P for the high-pressure
5 or initial cylinder D, and a slide-valve placed on the side of the expansion-cylinder B, the position of the motion-rods M', M², and M³ for operating these valves is such that no interference results, and that these rods can extend directly from their respective eccentrics
10 to the valves.

Having thus explained the nature and objects of my invention, with the method of applying the same, what I claim as new, and desire to secure by Letters Patent, is—
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1. An engine comprising the expansion-cylinder B and the high-pressure cylinder D, separated by a single intermediate head or diaphragm F, pistons J' J², piston-rod K, carrying the two pistons, slide-valve box L, and
20 valve arranged therein and on the side of the expansion-cylinder, valve-rod M' for operating said slide-valve, chamber N, distributing oscillating valve O, and oscillating steam cut-off and regulation valve P, both arranged
25 in the chamber N, cranks Q and R, and valve-rods M² M³, the latter of which being passed over the top of the valve-box L, whereby the rods M' M² M³ can be arranged parallel in
30 different horizontal planes and oscillating valves employed in conjunction with a slide-

valve, and said rods can be extended without any interference resulting therefrom, substantially as described.

2. An engine comprising the expansion-cylinder B and the high-pressure cylinder D, separated by a single intermediate head or diaphragm F, pistons J' J², piston-rod K, carrying the two pistons, slide-valve box L, and valve arranged therein and on the side of the
40 expansion-cylinder, valve-rod M' for operating said slide-valve, chamber N, distributing oscillating valve O, and oscillating steam cut-off and regulation valve P, both arranged in the chamber N, cranks Q and R, valve-rods
45 M' M³, the latter of which is passed over the top of the valve-box L, entrance-passage S, pipe T, and nozzle U, whereby the rods M' M² M³ can be arranged parallel in different horizontal planes and oscillating valves employed
50 in conjunction with a slide-valve, and said rods can be extended without any interference resulting therefrom, substantially as described.

In testimony whereof I have hereunto affixed my signature in the presence of two witnesses.
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WILLIAM H. OHMEN.

Witnesses:

ALFRED A. ENQUIST,
WILSON D. BENT, Jr.