

(No Model.)

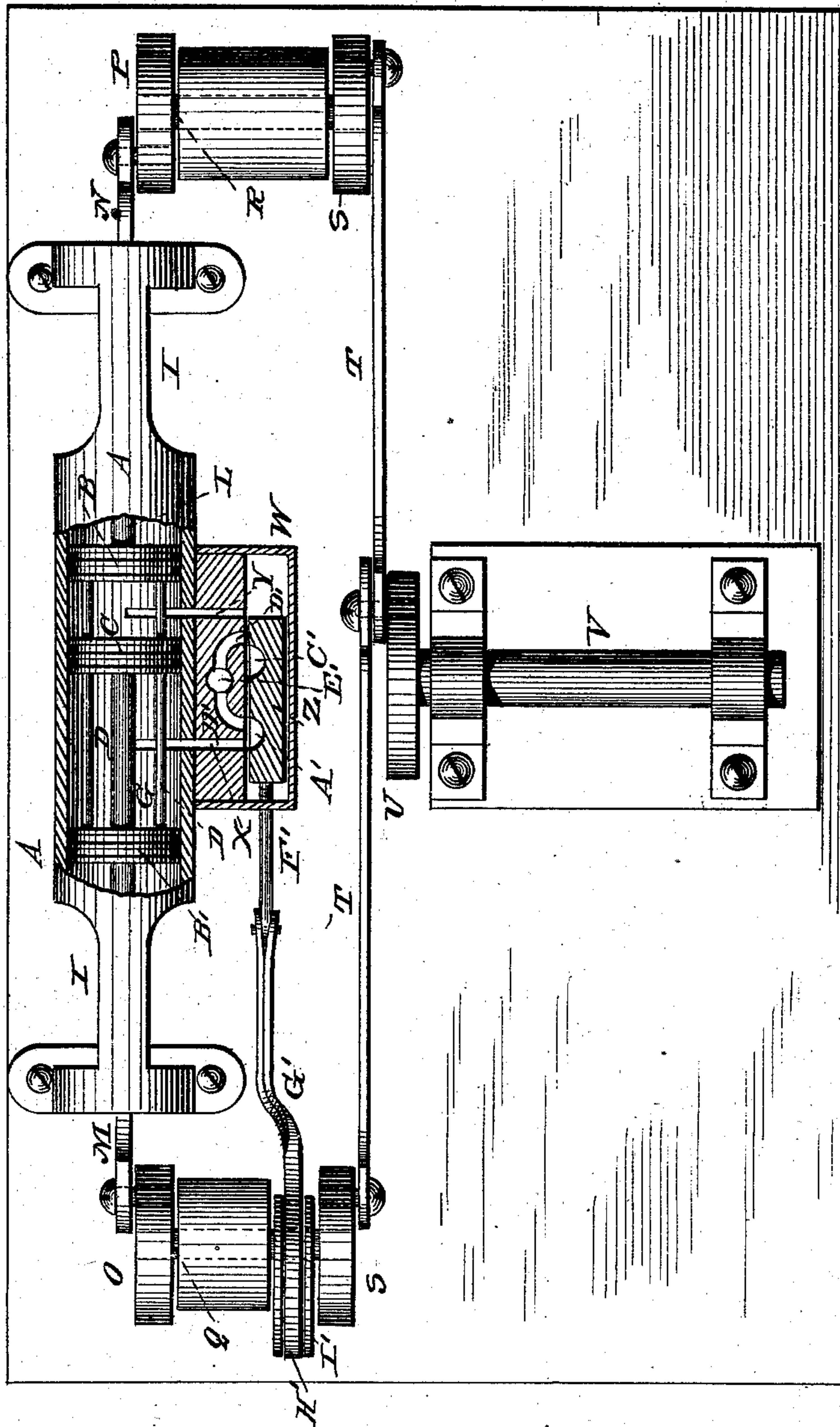
2 Sheets—Sheet 1.

J. ANDERSON & J. McDONALD.

STEAM ENGINE.

No. 257,996.

Patented May 16, 1882.



WITNESSES: 2

Med. G. Dietrich.
P. C. Dietrich.

INVENTORS

INVENTORS
James Anderson
John McDonald
vs. McDonald & Co.
ATTORNEYS.

(No Model.)

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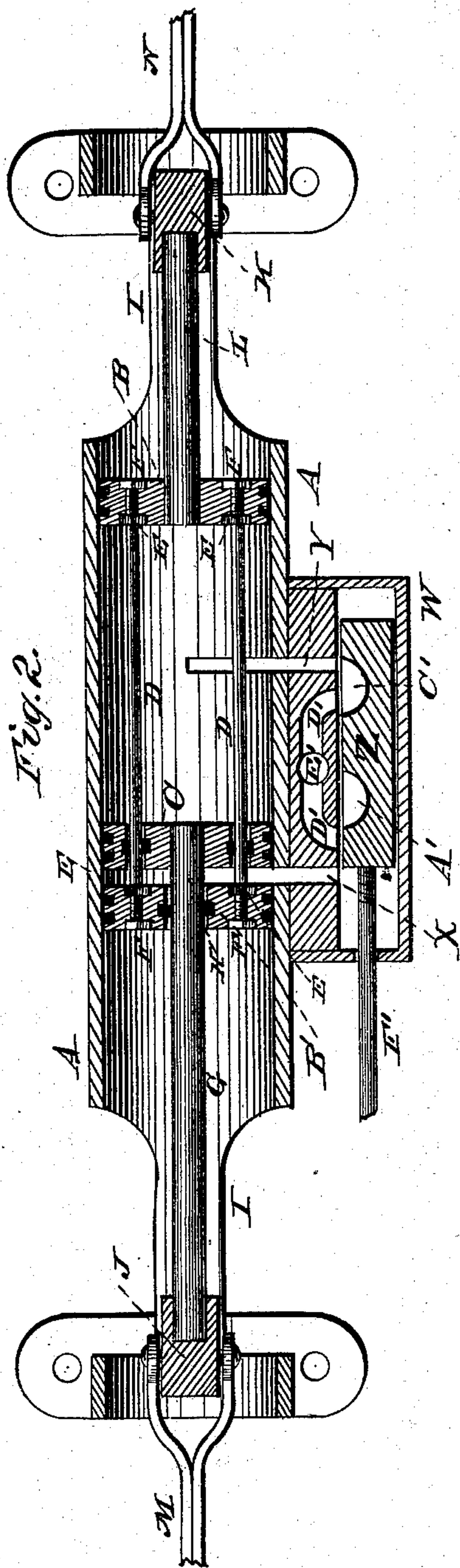


Fig. 2.

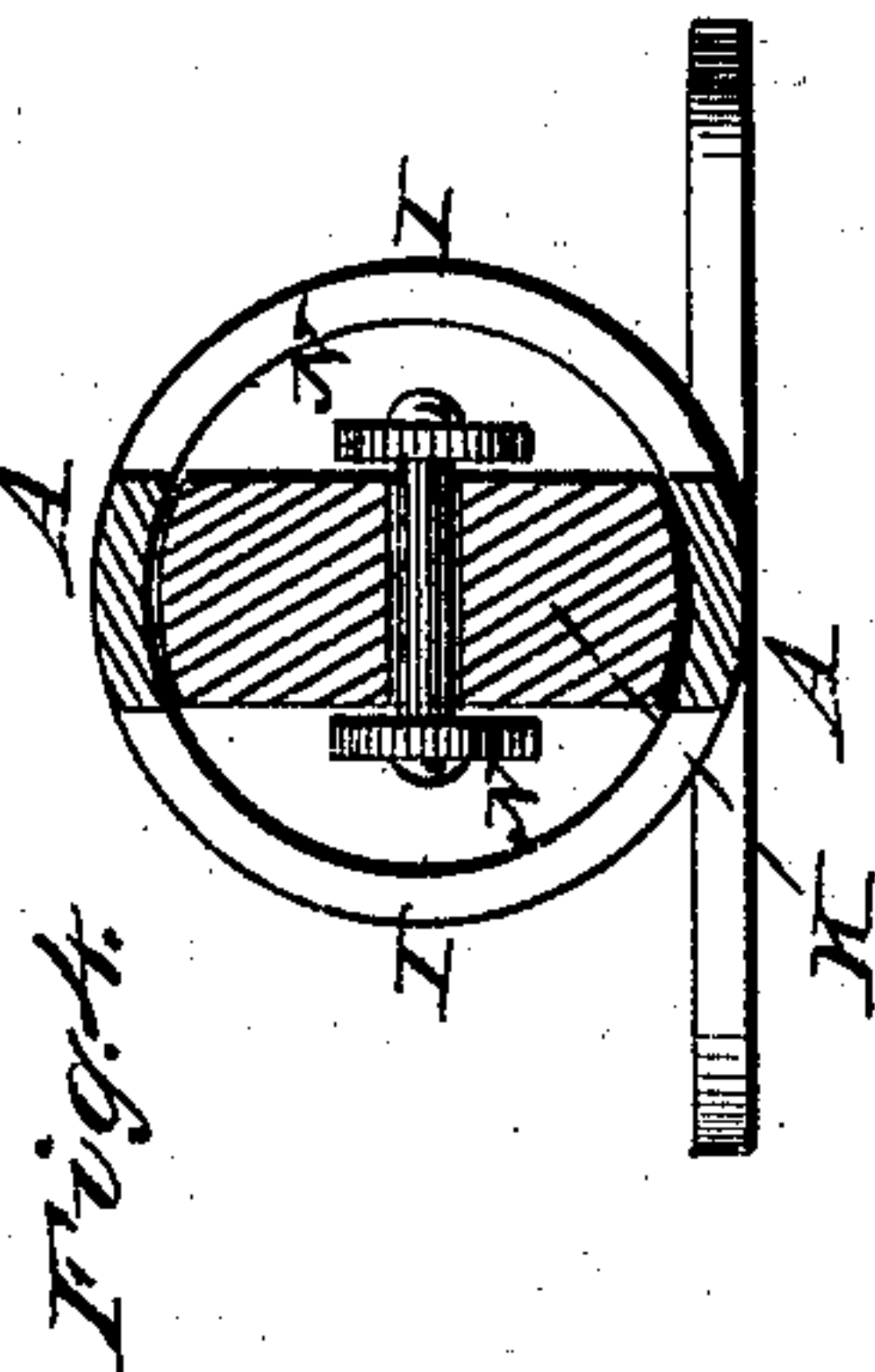
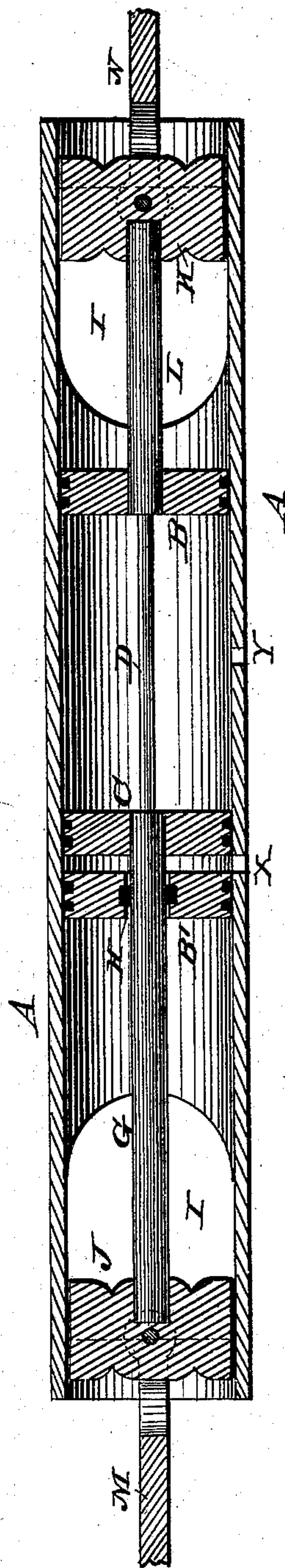


Fig. 3.

WITNESSES:

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UNITED STATES PATENT OFFICE.

JAMES ANDERSON AND JOHN McDONALD, OF CAMBRIDGEPORT, MASS.

STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 257,996, dated May 16, 1882.

Application filed March 3, 1882. (No model.)

To all whom it may concern:

Be it known that we, JAMES ANDERSON and JOHN McDONALD, of Cambridgeport, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Steam-Engines; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

Figure 1 is a plan view of our improved steam-engine, part of the cylinder and valve-casing having been broken away to expose the pistons and valve. Fig. 2 is a horizontal sectional view through the cylinder and valve-box. Fig. 3 is a vertical sectional view taken longitudinally through the cylinder, and Fig. 4 is a vertical cross-section through one of the cross-heads.

Corresponding parts in the several figures are denoted by like letters of reference.

This invention relates to reciprocating steam-engines; and it consists in certain improvements in the construction of the same, which will be hereinafter fully described, and particularly pointed out in the claim.

In the drawings hereto annexed, A represents the cylinder.

B, B', and C are pistons, the latter of which is located, as shown, between the two former. The pistons B B' are connected by metallic rods or bars D, having flanges E, which are countersunk in the inner sides of said pistons and secured by nuts F, countersunk in their outer sides. In this manner steam-tight joints may be formed without adding to the space occupied by the pistons. The rods D pass through suitable openings in the central piston, C, which are made steam-tight by suitable metallic packing. The piston-rod G of piston C passes through an opening, H, in piston B', which is made steam-tight by metallic packing. Another piston-rod, L, is attached to the piston B, as shown. The sides of the cylinder are provided near the ends, which are open, with counter-cuts I, exposing the cross-heads J K, to which the piston-rods G L are respectively connected. The cross-heads are connected by pitmen M N with the crank-wheels

O P upon the ends of shafts Q R, which are journaled in suitable bearings at the ends of the cylinder and transversely to the latter, as shown. The shafts Q R carry upon their inner ends crank-wheels S, which are connected by pitmen T with a crank-wheel, U, upon one end of the drive-shaft V.

The steam-chest W is located adjoining the cylinder A, as shown, and is provided with a suitably-arranged port for the admission of steam, and with two ports, X Y, opening into the cylinder.

Z is the slide-valve, arranged in the steam-chest, and having recesses A' C', adapted to connect the ports X Y, respectively, with the channels D', leading to the exhaust-port E'.

The valve-rod F' is connected by a rod or arm, G', with a collar, H', upon an eccentric, I', mounted upon the shaft Q, by which the valve is operated.

The operation of our invention will be readily understood from the foregoing description, taken in connection with the drawings hereto annexed. When the valve Z covers the port X live steam will enter the cylinder through port Y, between the pistons B' C, which are thereby forced apart, the pistons C B being thus at the same time brought toward each other, the steam between said pistons exhausting through port X. When the stroke is completed and the position of the valve reversed steam will enter through port X, thus forcing apart the pistons B C and bringing together the pistons C B', the steam between which exhausts through port Y. By this construction and arrangement the steam being introduced between two pistons, and not, as is usually the case, between a piston and a cylinder-head—which latter is rigid and immovable—no power is lost and better results are attained in a more economical manner. By mounting the cross-head, as described, in the counter-cut ends of the cylinder, they are firmly braced and caused to move steadily without much loss of power by friction.

Having thus described our invention, we claim and desire to secure by Letters Patent of the United States—

As an improvement in steam-engines, the cylinder A, having counter-cuts I I, forming segmental ways for the cross-heads J K, pis-

tons B B', connected by rods D, having flanges
and nuts countersunk in said pistons, central
piston, C, piston - rods G L, arranged as de-
scribed, pitmen M N, crank - shafts Q R, hav-
5 ing wheels O, P, and S, pitmen T, shaft V, hav-
crank-wheel U, steam - chest W, having ports
X Y, valve Z, having recesses A' C', channels
D', and exhaust-port E', and the eccentric I',
10 mounted upon shaft Q and connected with the
valve Z, all constructed, arranged, and oper-

ating substantially as herein shown and speci-
fied.

In testimony that we claim the foregoing as
our own we have hereto affixed our signatures
in presence of two witnesses.

JAMES ANDERSON.
JOHN McDONALD.

Witnesses:

HENRY ABRAHAMS,
J. R. LITTELL.