

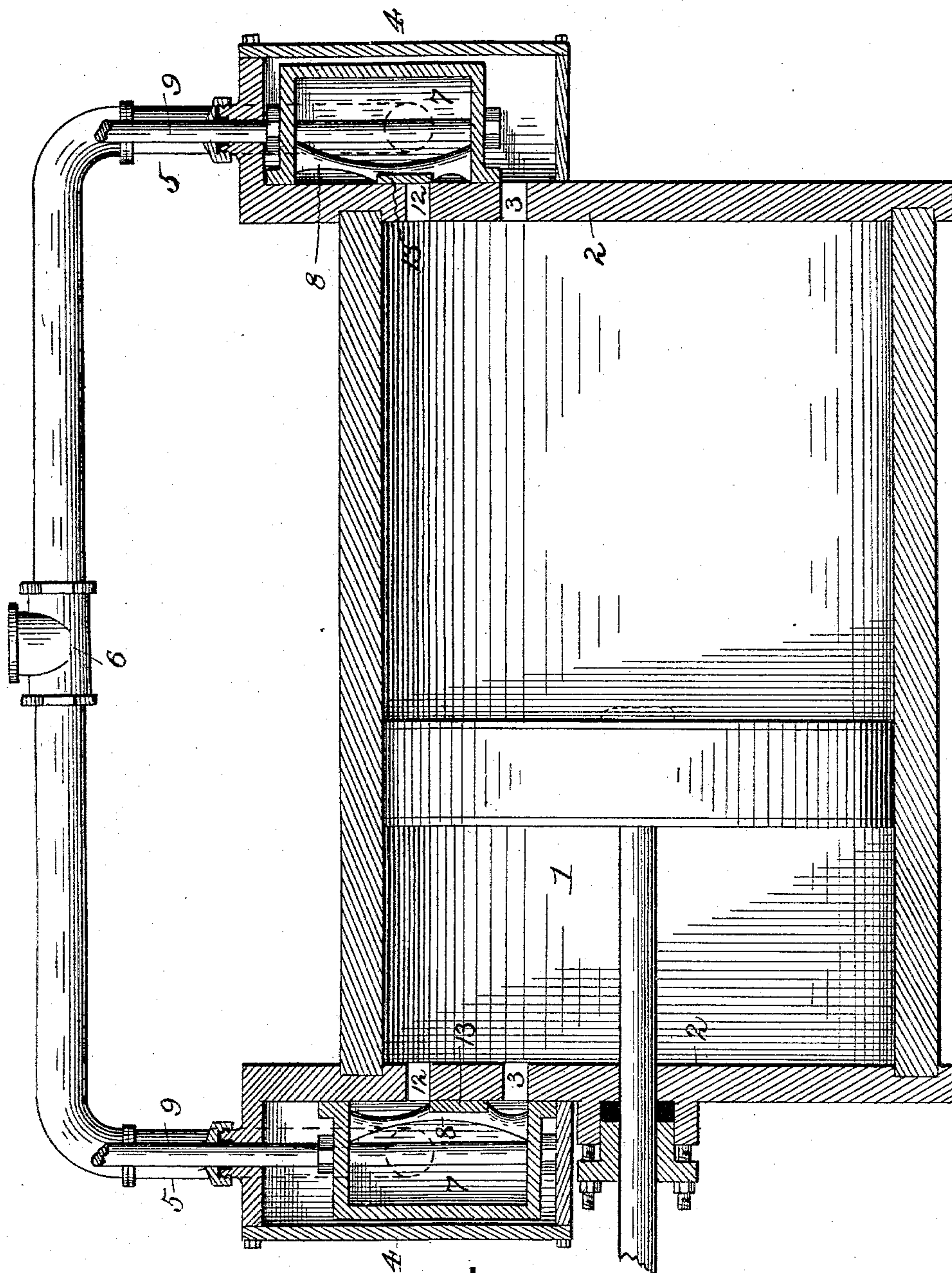
(No Model.)

2 Sheets—Sheet 1.

D. W. BRANCH.
VALVE FOR STEAM ENGINES.

No. 563,648.

Patented July 7, 1896.



Witnesses:

F. L. Ourand
Samuel Jones

Inventor:

Daniel W. Branch,
by Louis Baggett & Co.
Attorneys.

THE MORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

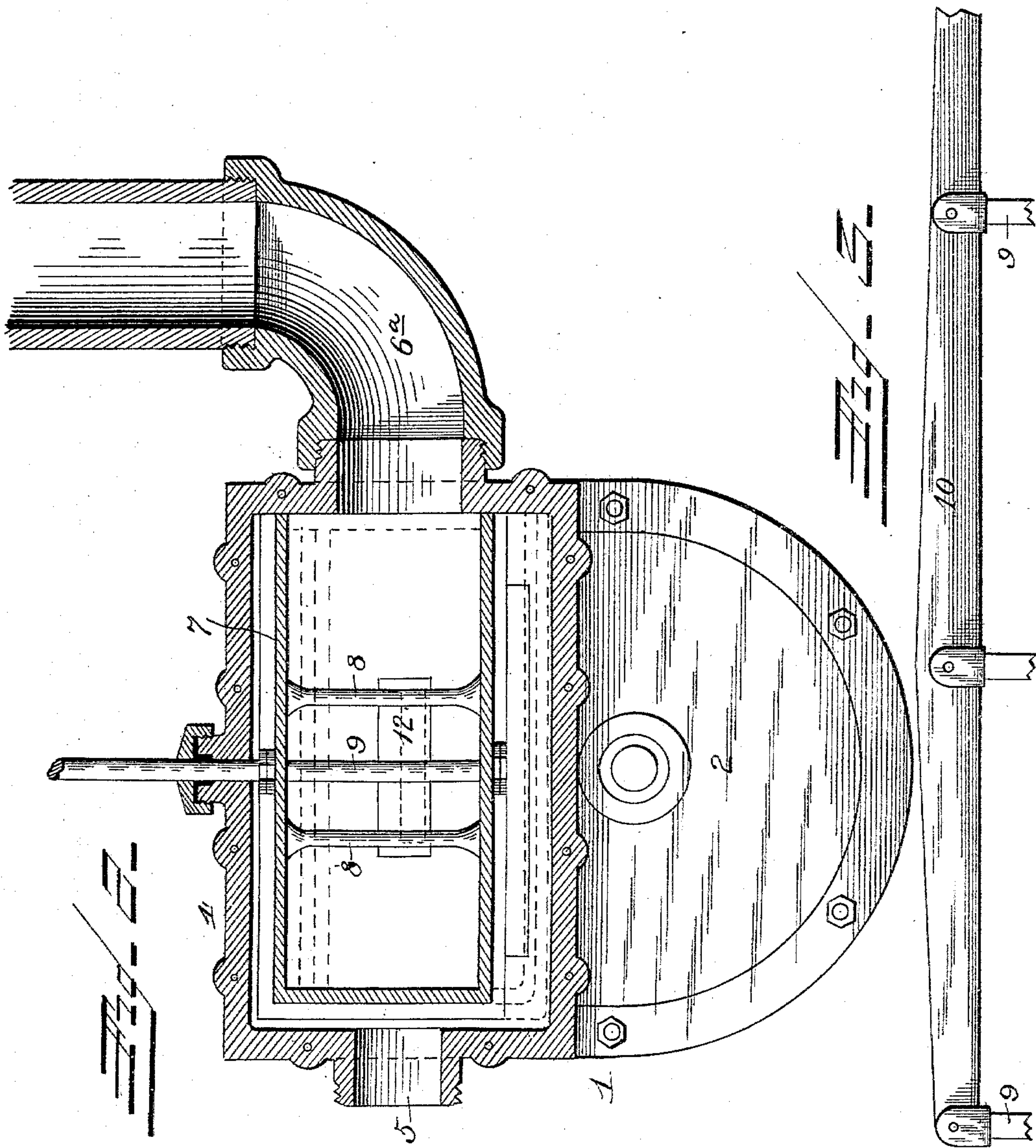
(No Model.)

2 Sheets—Sheet 2.

D. W. BRANCH.
VALVE FOR STEAM ENGINES.

No. 563,648.

Patented July 7, 1896.



Witnesses:
H. L. Orvand
J. M. H. Jones

Inventor:
Daniel W. Branch,
by Louis Ruggen Co.,
Attorneys.

UNITED STATES PATENT OFFICE.

DANIEL W. BRANCH, OF MONTGOMERY, ALABAMA.

VALVE FOR STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 563,648, dated July 7, 1896.

Application filed September 3, 1895. Serial No. 561,254. (No model.)

To all whom it may concern:

Be it known that I, DANIEL W. BRANCH, a citizen of the United States, and a resident of Montgomery, in the county of Montgomery and State of Alabama, have invented certain new and useful Improvements in Valves for Steam-Engines; and I 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.

My invention relates to improvements in steam-engines, whereby the usual long ports are done away with, and the ports formed in the cylinder-heads, whereby they can be made very much shorter, thus causing greater efficiency in use and a saving in fuel.

The invention consists, essentially, in a cylinder having a port and a valve-box at each end, a slide-valve located in said boxes, and means for actuating the same for alternately supplying steam to the cylinder and exhausting it therefrom.

It also consists in forming the cylinder-heads with an auxiliary exhaust-port, and the slide-valve with an auxiliary valve moving therewith, whereby the cylinder can be quickly exhausted, as will be hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of a steam-engine cylinder with my improvements applied thereto. Fig. 2 is a vertical sectional view on the line *xx*, Fig. 1. Fig. 3 is a detail view of the walking-shaft.

In the said drawings, the reference-numeral 1 designates a steam-cylinder, and 2 the heads thereof. These heads are formed with a rectangular port 3, each of which alternately serves as a supply and an exhaust port. Bolted to the cylinder-heads are valve-boxes 4, provided with inlet-pipes 5, connected with a steam-supply pipe 6, connected with a steam-generator, and at the opposite sides the valves are provided with outlet-pipes 6^a, which carry the exhaust-steam to any point desired. Located in each of these valve-boxes is a slide-valve 7, consisting of a box open at one side and one end, and provided with two bridges 8. Secured to these valves

are valve-stems 9, which are connected at their outer ends with an oscillating lever or walking-shaft 10, one end of which is connected with an eccentric (not shown) on the driving-shaft or some other moving part of the machine, so that the lever or walking-shaft is made to oscillate or reciprocate up and down, so as to alternately raise and lower the valves. The cylinder-heads, above said ports, are formed with auxiliary exhaust-ports 12, which are opened and closed alternately by means of auxiliary valves 13, secured to the valve-bridges and moving therewith.

The operation is as follows: In the position shown in Fig. 1 the piston is on its forward stroke, the port at the right of the cylinder being open or in communication with the valve-chest, so that steam will enter the cylinder therethrough, the auxiliary exhaust-valve at this end being closed and the auxiliary valve at the other end being open. The port at this, or the left, end of the cylinder is in alinement with the open side of the valve, through which and the auxiliary valve steam in the cylinder exhausts through the open end of the valve into the exhaust-pipe. When the piston reaches the end of its stroke, the valves will be reversed by the walking-beam, the one to the left being raised, opening communication between the steam or valve box and the port in the end of the cylinder, and allowing the steam to enter the cylinder through said port. At the same time the auxiliary port will be closed, and the auxiliary exhaust-port at the opposite end of the cylinder will be opened, and the main port will also be placed in communication with the exhaust-opening in the slide-valve.

The invention can be used with stationary, locomotive, and marine boilers, and it can also be attached to ordinary steam-engine cylinders by filling up the long ports therein with Babbitt metal, forming the ports in the heads of the cylinders, and securing the valve-boxes and connections thereto.

It will be seen that the length of the ports in the cylinder-heads is only that of the thickness of the same, thus effecting a decided advantage over the ordinary long ports.

Having thus fully described my invention, what I claim is—

1. In a steam-engine, the combination with
the cylinder having a single port at each end,
which alternately acts as an inlet and an out-
let port, of the valve-boxes at each end of
5 the cylinder having inlet and outlet pipes,
the slide-valve having an open side and an
open end, and means for alternately recipro-
cating said valves, substantially as described.

2. In a steam-engine, the combination with
10 the cylinder having ports in each end, and
also having auxiliary ports, of the valve-boxes
provided with inlet and outlet pipes, the slide-

valves having openings in one side and end,
the auxiliary valve carried thereby, and
means for actuating said valves; substantially 15
as described.

In testimony that I claim the foregoing as
my own I have hereunto affixed my signature
in presence of two witnesses.

DANIEL W. BRANCH.

Witnesses:

SIMON WEIL,

N. R. WILHELM.