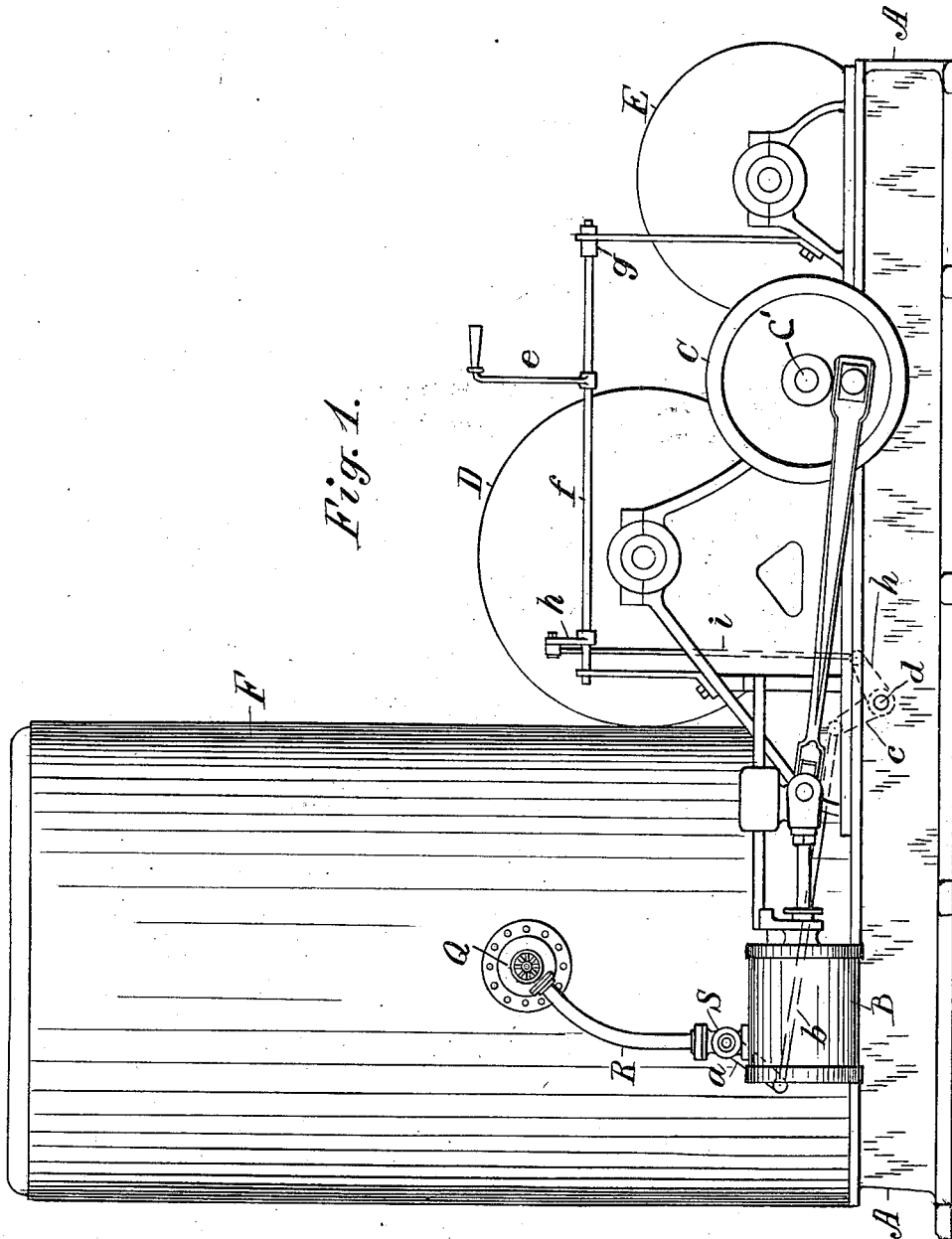


1,043,441.

2 SHEETS—SHEET 1.



Inventor
Asher Lambert, per
Thomas S. Crane, Atty.

A. LAMBERT.
 DUPLEX STEAM HOISTING ENGINE AND BOILER.
 APPLICATION FILED SEPT. 11, 1911.

1,043,441.

Patented Nov. 5, 1912.

2 SHEETS—SHEET 2.

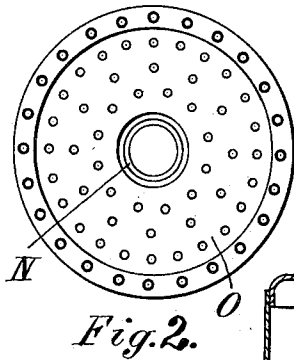


Fig. 2.

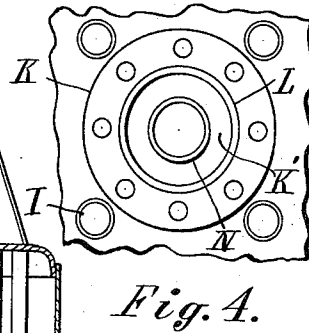


Fig. 4.

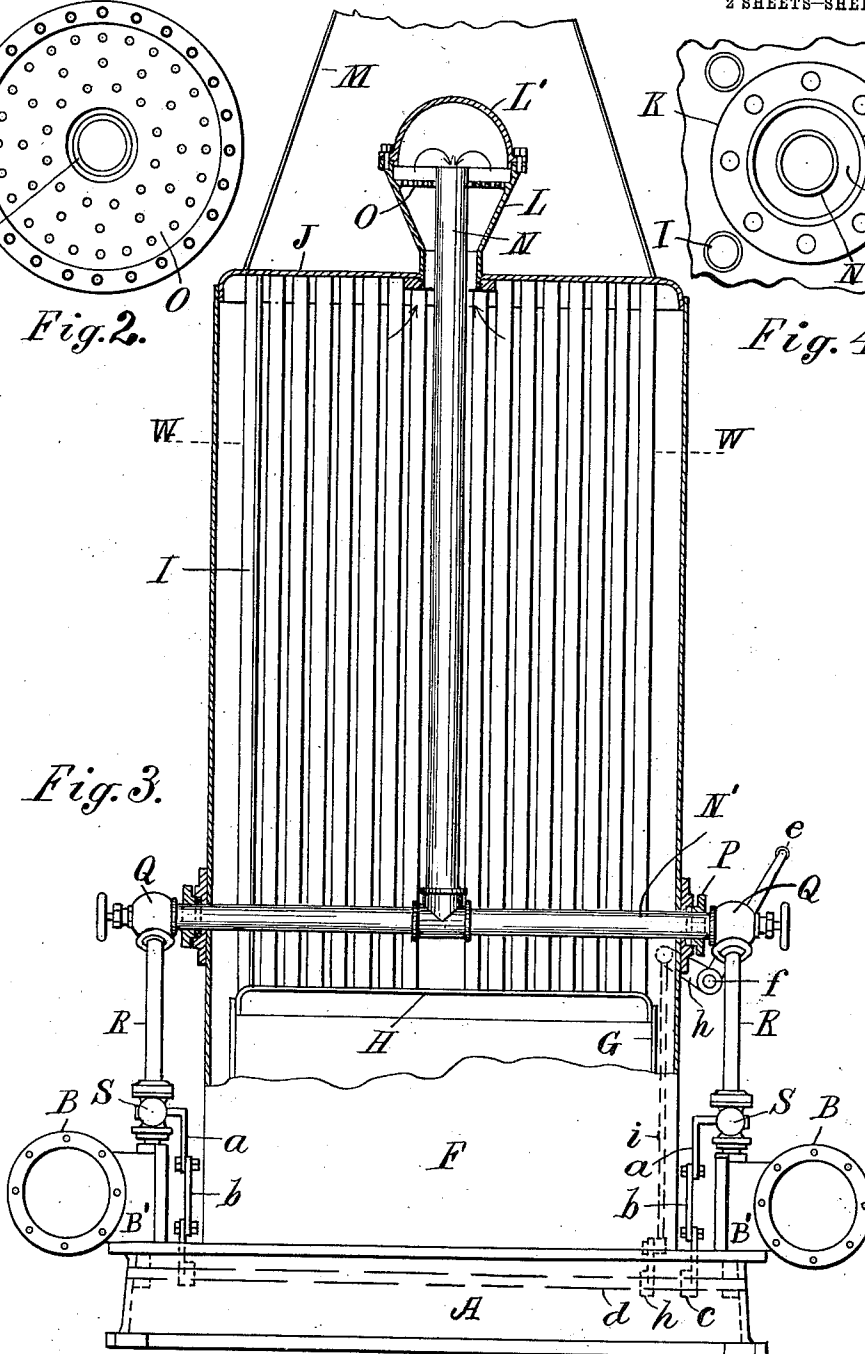


Fig. 3.

Witnesses:
 L. Lee.
 J. Walter Greenbaum.

Inventor
 Asher Lambert, per
 Thomas S. Graw, atty.

UNITED STATES PATENT OFFICE.

ASHER LAMBERT, OF NEWARK, NEW JERSEY.

DUPLEX STEAM HOISTING-ENGINE AND BOILER.

1,043,441.

Specification of Letters Patent.

Patented Nov. 5, 1912.

Application filed September 11, 1911. Serial No. 648,762.

To all whom it may concern:

Be it known that I, ASHER LAMBERT, a citizen of the United States, residing at 1 Johnson avenue, Newark, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Duplex Steam Hoisting-Engines and Boilers, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The object of this invention is to improve the joint operation of the two steam-cylinders used in duplex hoisting-engines, by supplying the same with dry steam and maintaining the boiler pressure in the steam-supply pipes close to the engine cylinders.

Heretofore, it has been common to mount an upright boiler upon the frame of a two-cylinder hoisting-engine with an engine-cylinder at each side of the boiler, and to supply both cylinders through a single supply-pipe provided with a throttle-valve which is necessarily placed in the main steam-pipe and not in the branches connected to the cylinders. Where such a steam-pipe is connected with the top of a boiler and a throttle-valve is suddenly opened, it is common for the water to foam and to pass with the steam into the main steam-pipe, producing a great hindrance to the working of the engines.

In the present invention, I secure the delivery of dry steam to the engines by locating a steam and water-separator in the smoke-bonnet on top of the boiler, which separator is in connection with the steam-space in the boiler, and also by leading the main steam-pipe downward from such separator within the boiler and extending branches therefrom over the crown-sheet of the firebox, and outwardly through the sides of the boiler to a throttle-valve placed upon each steam-chest, thus carrying the full steam pressure close to the steam-chest. To shut off the steam in case the throttle-valve or engine becomes deranged, I also provide an angle-valve upon each of the branch-pipes where it emerges from the boiler. Means is provided for opening the throttle-valves simultaneously in the same degree, so as to start both engines at the same time.

The nature of the invention and its operation will be understood by reference to the annexed drawing, in which—

Figure 1 is a side elevation of a hoisting-engine provided with the improvements;

Fig. 2 is a plan of the separator with its dome removed; Fig. 3 is an end elevation next the steam-cylinders with the boiler in section at the center line where hatched; and Fig. 4 shows the under side of the upper tube-sheet with the connection of the steam-separator.

A designates the frame of the engine, B the steam-cylinders, and C the crank-wheels to which the connecting-rods of both engines are connected, as shown in Fig. 1, and which wheels and the crank-shaft C' operate by well known means, as drums D and E.

F is an upright tubular boiler with firebox G in the bottom having crown-sheet H and tubes I extended upwardly to the upper tube-sheet J. The tubes are omitted in the center of the tube-sheet, to admit a threaded flange K, and a separator body L formed of a steel casting is screwed into such flange from the upper side of the tube-sheet, thus bringing it in the center of the smoke-bonnet M where it is highly heated by the escaping gases.

The neck of the body forms an open passage K' through which the steam-pipe is extended upwardly, and the sides of the body are flared outwardly where it is covered by a removable dome L', and the passage K' is materially larger than the steam-supply dry-pipe N, as shown in Fig. 4, and said pipe extends upwardly in the body through a perforated baffle-plate O, which is fully shown in Fig. 2.

The dry steam-pipe extends downwardly nearly to the crown-sheet H, and is provided with branches N' which extend outwardly through the stuffing-boxes P upon the sides of the boiler nearly over the steam-cylinders B.

The ends of the branch-pipes are provided with angle-stop-valves Q which deliver the steam to delivery-pipes R, each of which is connected with a throttle-valve S upon the steam-chest B' of the cylinder.

When the hoister is in use, the angle-valves Q are kept open, and the supply of steam to the engines is regulated by the throttle-valves which have levers a connected by links b to similar arms c upon a rock-shaft d extended across the frame A near the forward side of the boiler and actuated by connection to a hand-lever e. Such connection is made by a hand-shaft f mounted in bearings g at the side of the hoister and connected with the rock-shaft d by cranks h and a link i. The hand-lever e upon such

shaft when moved in one direction opens the throttle-valves simultaneously.

W shows the water-line in the boiler, and when the throttle-valves are opened suddenly the water tends to foam, but any of it rising into the separator through the passage K' is arrested by the baffle-plate and thrown backwardly into the boiler.

As the passage K' surrounds the pipe N, the current of up-flowing steam follows such pipe, while the precipitated water moves down upon the sloping sides of the separator. The tendency of water to enter the delivery-pipe N is much less than where the pipe is inserted directly in the tube-sheet J in the usual manner, because the passage K is several times larger than the area of the pipe, and the velocity of the steam passing through such passage is greatly reduced.

Experience has shown that only dry steam passes into the dome L' and downward through the pipe N. As the pipe N is inclosed wholly in the heated water and steam, and its branches N' lie close to the crown-sheet, the steam is delivered to the cylinder supply-pipes R in a highly heated condition and with full pressure up to the throttle-valves S. The steam is thus able to operate more effectively in the engines, and a lesser opening of the throttle-valves is required, and a quicker starting is thus secured.

There is obviously a great advantage in attaching separate throttle-valves to the steam-chests of the two cylinders, as they permit full boiler pressure to be always exerted in the delivery-pipes close to the cylinders when the throttle-valves are closed enabling the steam to operate more effectively in starting the engine.

I do not claim the connecting of two throttle-valves together, as such connection is common where simultaneous operation of the valves is required, but the essential novelty in my invention is the means of sup-

plying the engine with steam from the boiler by the connection of separate steam delivery-pipes to a main boiler supply-pipe and the provision of separate throttle-valves upon the ends of these separate delivery-pipes for connection to the steam-chests of the engine cylinders, by which the boiler pressure may be maintained close to the engine-cylinders.

Having thus set forth the nature of the invention what is claimed herein is:

1. A duplex steam-hoisting-engine having an upright steam-boiler with two steam-engine-cylinders one arranged at each side of said boiler with a steam-chest upon each cylinder, a throttle-valve secured upon the steam-chest of each cylinder, means for separately operating said throttle-valves, separate delivery-pipes extended through the sides of the boiler near such throttle-valves and connected directly to the throttle-valves, and means within the boiler for conducting the steam of the boiler into such delivery-pipe.

2. In a duplex steam hoisting-engine having a cylindrical tubular boiler with an engine cylinder and steam-chests at each side of the same and a throttle-valve secured upon each steam-chest, the combination, with the said parts, of a steam supply-pipe within the boiler having branches extended outwardly through the sides of the boiler and connected with the said throttle-valves, means for simultaneously operating said throttle-valves and an angle-valve upon each of such branch-pipes for controlling the supply of steam separately to the two throttle-valves.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ASHER LAMBERT.

Witnesses:

A. HARRIS,
THOMAS S. CRANE.