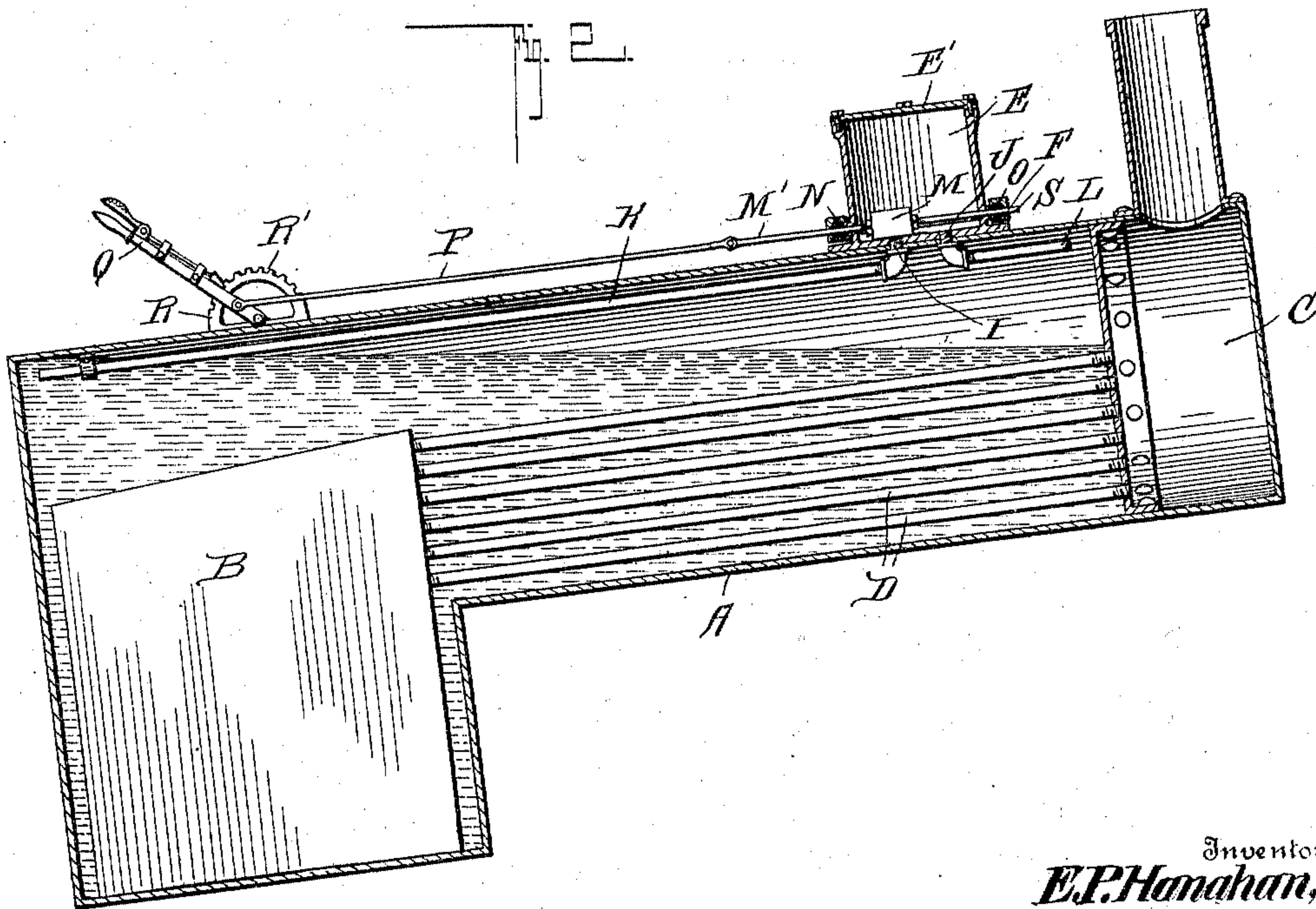
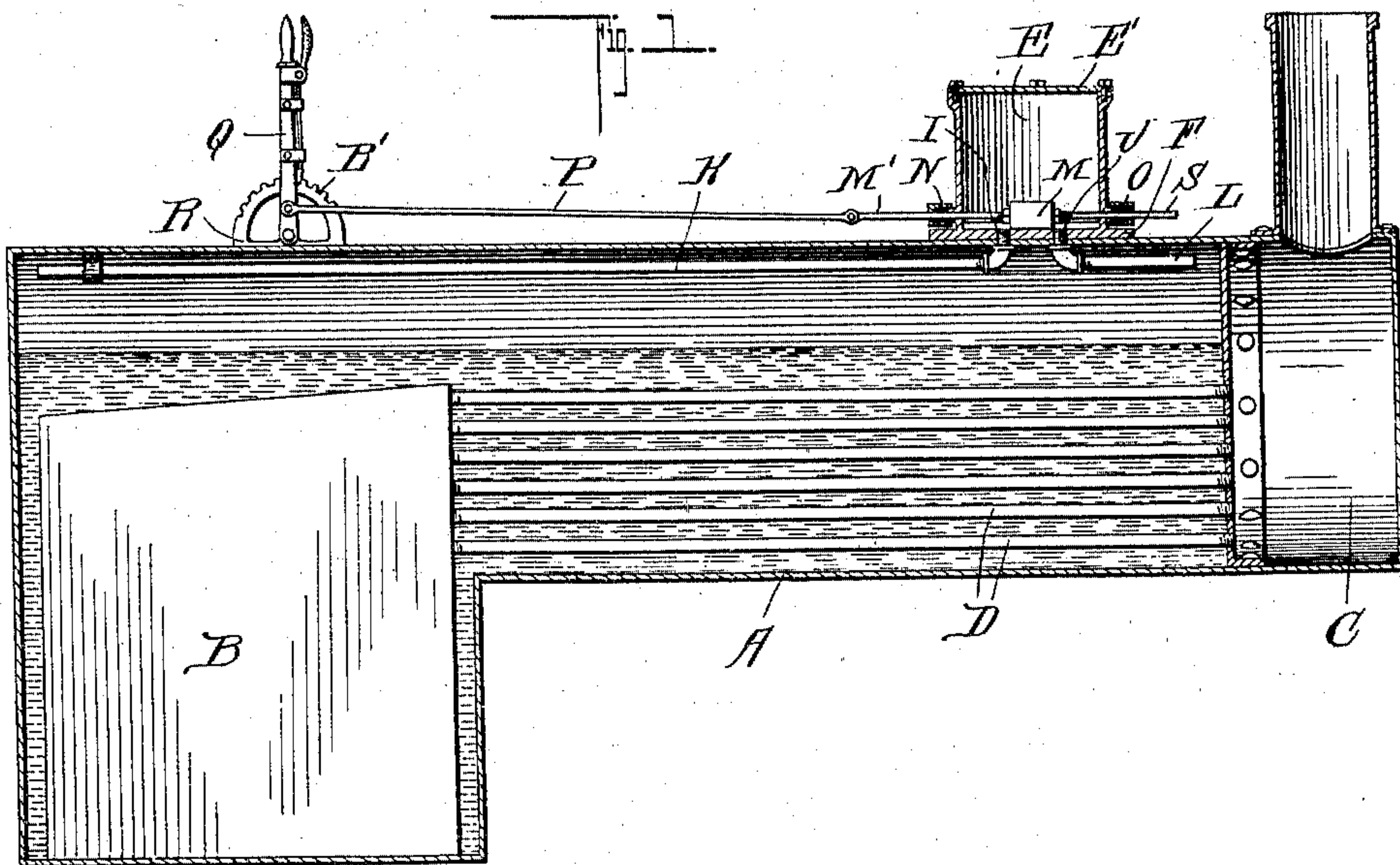


E. P. HANAHAN.  
 STEAM BOILER.  
 APPLICATION FILED NOV. 5, 1909.

967,763.

Patented Aug. 16, 1910.

2 SHEETS—SHEET 1.



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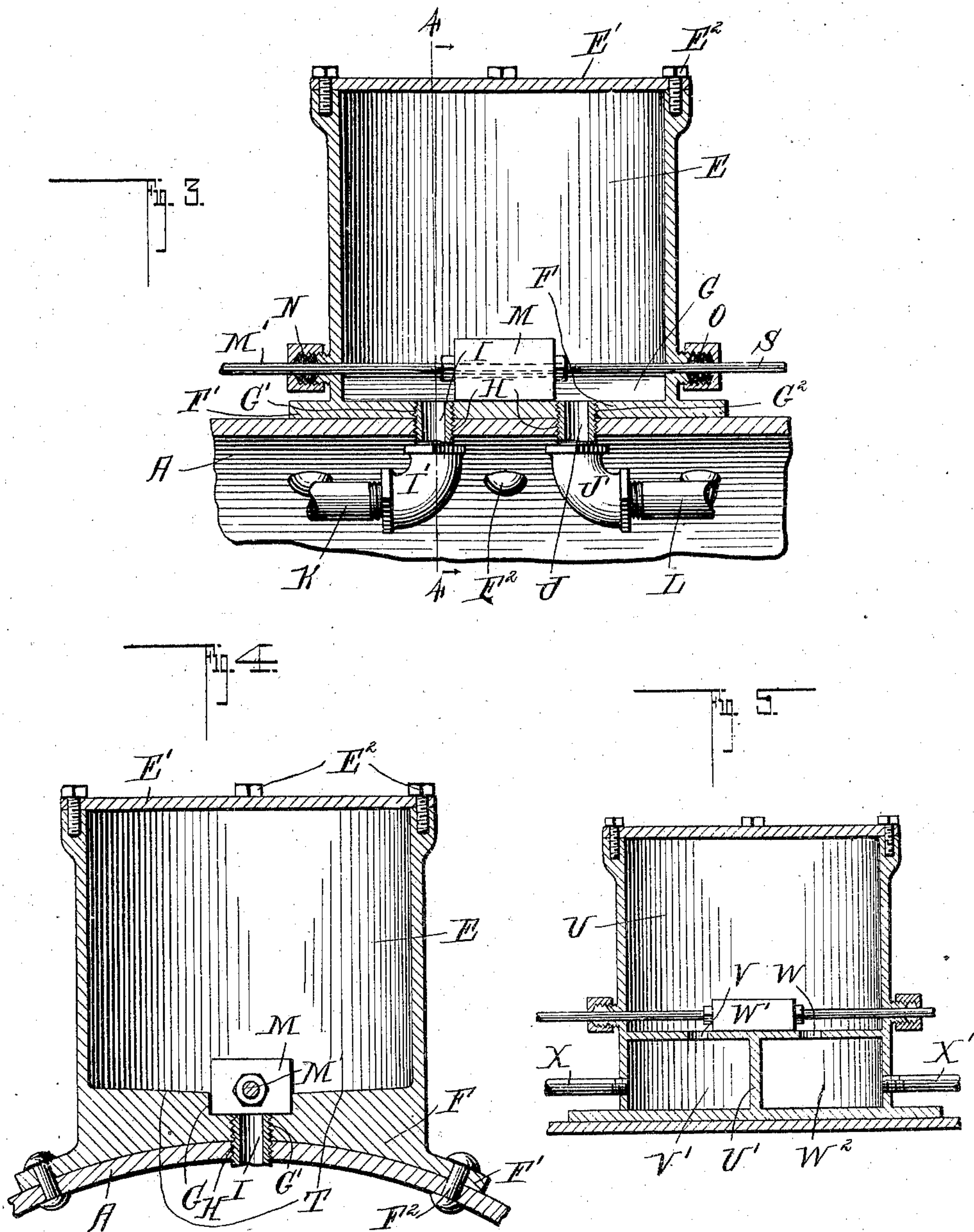
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# UNITED STATES PATENT OFFICE.

EDWARD P. HANAHAN, OF SPRINGFIELD, OHIO.

## STEAM-BOILER.

967,763.

Specification of Letters Patent. Patented Aug. 16, 1910.

Application filed November 5, 1909. Serial No. 526,383.

*To all whom it may concern:*

Be it known that I, EDWARD P. HANAHAN, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented a new and useful Improvement in Steam-Boilers, of which the following is a specification.

This invention relates to steam boilers especially adapted to be used on steam engines of the portable type, such as traction engines and locomotives, and more particularly to traction engines for hauling harvesting machines or threshers where it is necessary for these engines to travel up and down steep grades.

The object of the invention is to provide a steam boiler which is so constructed that steam can be taken from the boiler from either the front or rear end according to the position of the engine upon the grade whereby exceedingly dry steam can be allowed to pass into the steam dome. Where steam is taken from one end of the boiler only and the engine is on a grade so as to throw the water to the end provided with the outlet pipe, more or less water will find its way into the steam pipes and thence to the engine cylinders carrying with it a certain amount of grit and sediment which injures the cylinders to a certain extent.

Another object of my invention is to provide a steam boiler which is provided with outlet pipes extending in opposite directions, said outlet pipes communicating with the steam dome and being controlled by a slide valve so that when the water is backed up at one end of the boiler caused by the engine being on an uneven grade, the pipe leading from that end will be closed so that the steam can be taken from the other end of the boiler.

A still further object of the invention is to provide a steam dome with a central groove forming a valve seat, the bottom of said dome to each side of said groove being inclined so that the condensed steam will be carried back into the boiler through one of the outlet pipes.

With these various objects in view, my invention consists in the novel features of construction, arrangement and combination of parts, all of which will be hereinafter fully described and pointed out in the claims.

In the drawings forming a part of this specification: Figure 1 is a longitudinal ver-

tical section through a steam boiler showing the application of my improved invention, the boiler being shown in a horizontal position. Fig. 2 is a similar view showing the boiler in an inclined position which is assumed when the engine is traveling up grade, the valve being moved so as to close the outlet pipe leading from the rear end of the boiler. Fig. 3 is an enlarged vertical longitudinal detail section through a portion of the boiler and the steam dome. Fig. 4 is a section taken on the line 4-4 of Fig. 3, and Fig. 5 is a vertical longitudinal section through a modified form of steam dome.

Referring to the drawing A indicates a steam boiler which is provided with a combustion chamber B at one end connected to the smoke box C at its forward end by flues or tubes D, said smoke box being provided with an ordinary smoke stack as clearly shown, the above description being given so that my improved invention can be readily understood.

In carrying out my improved invention, I employ a steam dome E having a curved bottom F provided with an apertured flange F' through which rivets F<sup>2</sup> are adapted to pass for securing the same in position on the top of the boiler. The dome is provided with a removable top E' which is secured in position by machine screws E<sup>2</sup> so that the same can be readily removed when it is desired to reach the interior of the dome.

The inner wall of the bottom of the steam dome E is provided with a central longitudinal groove G having threaded spaced bores G', G<sup>2</sup> communicating therewith forming outlet ports which register with threaded bores H formed in the top of the boiler A in which are adapted to be screwed threaded pipe sections I and J to which are connected elbows I' and J' in which are secured the threaded ends of steam outlet pipes K and L, the pipe K extending rearwardly parallel and spaced from the top of the boiler to a point adjacent the rear end and the pipe L extending forwardly parallel with the top of the boiler to a point adjacent the forward end of the boiler, and it will be seen that by this arrangement one of the steam pipes K or L will be always held above the water level of the boiler when the boiler is thrown into an inclined position caused by the engine traveling up or down grade.

The pipe sections I and J have their ends



flush with the bottom of the groove G formed in the bottom of the steam dome and form valve seats for a slide valve M which is mounted within the groove G, said valve being of such a length that the same can be moved into the position shown in Fig. 3 so as to occupy the space between the pipe sections I and J whereby the steam pipes K and L will take steam from the boiler and it will be seen that by moving the valve M either forwardly or rearwardly one of the ports formed by the pipe sections I and J will be closed so as to prevent the steam from being taken from that pipe which is clearly shown in Fig. 2, so that when the engine is traveling up grade the pipe which is submerged in the water of the boiler will be closed. When the engine is traveling down grade the valve is moved so as to close the port formed by the pipe section J so that steam will be taken through the pipe K.

For operating the valve M, I provide the opposite sides of the steam dome with stuffing boxes N and O and extending into the dome through the stuffing box N is a valve stem M' to which is pivotally connected an operating rod P which is pivotally connected at its free end to a hand operated lever Q mounted on a bracket R which is provided with a segmental rack portion R' for locking the lever in its adjusted position. The bracket is preferably arranged upon the boiler as clearly shown, but it is of course understood that the bracket can be arranged on the engine in any desired position so that the same can be readily reached by the engineer. Connected to the opposite side of the valve M is a guide rod S which extends out through the stuffing box O of the dome E so as to guide and hold the valve M in its proper position so that all danger of the valve being raised by the steam pressure off of one of the ports is prevented.

The bottom of the steam dome to each side of the groove G is inclined as shown at T so that the steam that condenses within the dome will be carried back into the boiler through one of the pipes.

In the modification shown in Fig. 5, I show a dome U especially adapted to be used on old forms of traction engines where it is desired to arrange the steam outlet pipes on the outside of the engine instead of on the inside and said dome is provided with a diaphragm U' having ports V and W which are adapted to be closed by a slide valve W' constructed similar to the form shown in Figs. 1, 2, 3 and 4 and operated in a similar manner. The diaphragm divides the lower portion of the dome into two steam chambers V' and W' which are provided with inlet openings into which the steam pipes X and X' are adapted to be secured, said steam pipes leading from the opposite ends of the boiler.

From the foregoing description, it will be seen that I have provided a steam boiler with a steam dome which is so connected to the interior of the boiler that steam can be taken from the boiler from either end according to the position of the boiler caused by the engine traveling over uneven ground.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. The combination with a steam boiler, of a dome arranged on said boiler provided with a longitudinal groove in its bottom, pipe sections communicating said groove with said boiler, pipes connected to said pipe sections having their open ends arranged adjacent the opposite ends of said boiler, and a valve slidably mounted in said groove of the dome.

2. The combination with a steam boiler, of a dome arranged on said boiler having a central longitudinal groove formed in its bottom and provided with inclined side portions, pipes extending through said boiler into said groove, elbows carried by said pipes, steam pipes carried by said elbows extending in opposite directions and terminating short of the ends of the boiler, and a valve slidably mounted within the groove for closing said pipes.

3. A steam boiler for engines comprising a boiler proper having spaced threaded bores formed in its top, a dome arranged on the top of said boiler provided with threaded bores registering with the threaded bores of the boiler, threaded pipe sections arranged in said threaded bores, elbows carried by said pipe sections, steam pipes carried by said elbows extending into the front and rear of said boiler and a slide valve mounted in said dome for closing either of said pipe sections.

4. The combination with a steam boiler provided with spaced threaded bores in its top, of a dome arranged over said openings having threaded bores in its bottom registering with the threaded bores of the boiler, said dome being provided with a longitudinal groove in its bottom into which said threaded bores extend, threaded pipe sections arranged in the bores of said dome and boiler, pipes carried by said threaded pipe sections extending in opposite directions to the front and rear of said boiler, a slide valve mounted in said groove for closing said pipe sections, and a hand lever for operating said valve.

5. The combination with a steam boiler provided with spaced openings in its top, of a dome arranged over said openings provided with openings registering with the same, steam pipes arranged in said boiler having their open ends arranged adjacent the front and rear ends of said boiler, said pipes being carried by pipe sections ar-



5 ranged in the openings of the boiler dome, stuffing boxes formed on the opposite sides of said dome, a valve slidably mounted in said dome provided with a guide rod at one end extending through one of said stuffing boxes and a valve stem at the other end extending through the other stuffing box, a rod connected to said valve stem and a lever for operating said rod.

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