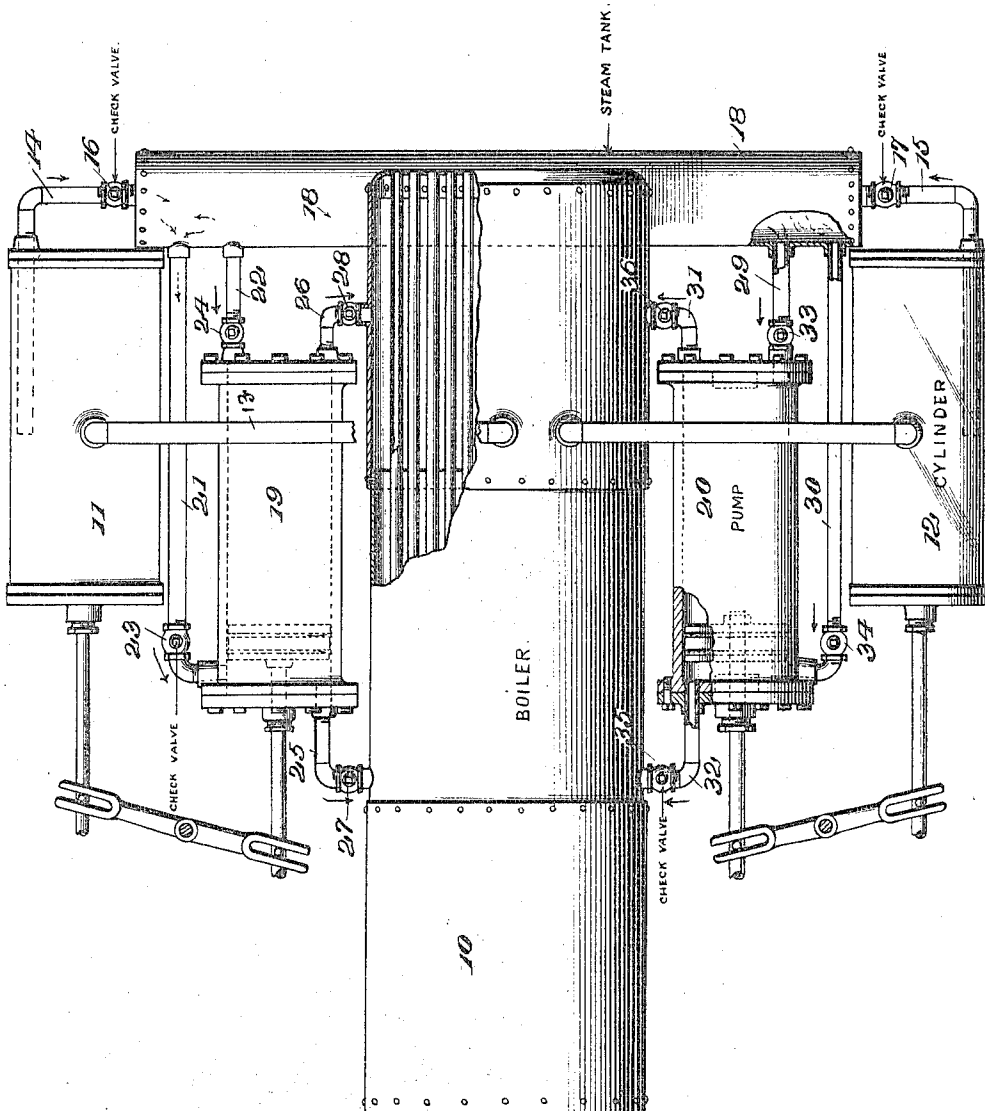


J. SCHINDLER.
 UTILIZING EXHAUST STEAM.
 APPLICATION FILED MAY 25, 1911.

1,036,915.

Patented Aug. 27, 1912.



Inventor

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Witnesses

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UNITED STATES PATENT OFFICE.

JOSEPH SCHINDLER, OF ELLENSBURG, WASHINGTON.

UTILIZING EXHAUST-STEAM.

1,036,915.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOSEPH SCHINDLER, a citizen of the United States, residing at Ellensburg, in the county of Kittitas and State of Washington, have invented certain new and useful Improvements in Means for Utilizing Exhaust-Steam, of which the following is a specification.

My invention relates to a novel means for returning exhaust steam from an engine back into the boiler, whereby energy is saved and the cost of operating the engine reduced.

My invention consists in certain constructions, combinations and arrangements of parts, the preferred form of which will be first described in connection with the accompanying drawings and then the invention particularly pointed out in the appended claim.

In the drawing I illustrate the preferred form of my invention by a plan view with parts broken away.

10 designates a boiler of any known or desired construction.

11 and 12 are a pair of cylinders which are supplied with steam from the boiler through the supply pipes 13 in the usual manner.

14, 15 are the exhaust pipes of the cylinders 11 and 12 respectively. These exhaust pipes are each provided with a check valve 16, 17, and are connected to a steam tank 18 which is preferably located beneath one end of the boiler as shown.

19 and 20 are a pair of pump cylinders each provided with a piston that is reciprocated from any desired source of power, preferably being connected to the piston rods of the cylinders 11 and 12.

21, 22 designate a pair of pipes, one connecting one end of the cylinder 19 and the other the other end of said cylinder with the tank 18. These pipes are each provided with a check valve 23, 24 respectively, which prevent the return of steam from the pump to the tank. Each end of the pump cylinder 19 is also connected to the boiler by means of the pipes 25, 26, the pipe 25 being provided with a check valve 27 and the

pipe 26 with a check valve 28, these check valves permitting the passage of steam from the pump to the boiler but preventing the flow from the boiler to the pump.

The pump cylinder 20 is connected to the tank and boiler in the same manner as the cylinder 19, the pipes 29, 30 connecting the opposite ends of the pump with the tank 18, and the pipes 31, 32 connecting the opposite ends of the pump with the boiler. Each of these pipes is provided with a check valve 33, 34, 35 and 36, corresponding with the check valves 23, 24, 27 and 28.

In the operation of my invention the exhaust from the cylinders 11 and 12 is lead into the tank 18, and the actuation of the pumps 19 and 20 withdraws the exhaust steam stored in the tank 18 and returns the same in the boiler, whereby a large percentage of the energy of the exhaust steam which would otherwise be wasted is saved.

I realize that considerable variation is possible in the details of construction and arrangement of parts without departing from the spirit of my invention, and I therefore do not intend to limit myself to the specific form shown and described.

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

The combination with a boiler, of an engine cylinder, a pipe for supplying steam from the boiler to the cylinder, a tank, an exhaust pipe connecting the cylinder to the tank, a check valve in said pipe preventing the return of steam from the tank to the cylinder, a pump, pipes connecting the opposite ends of the pump to the tank, pipes also connecting the opposite ends of the pump to the boiler and check valves in said pipes.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH SCHINDLER.

Witnesses:

GEORGE A. GUNDERSON,
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