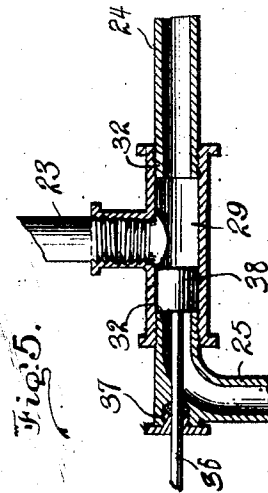
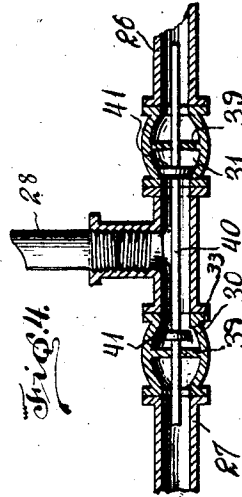
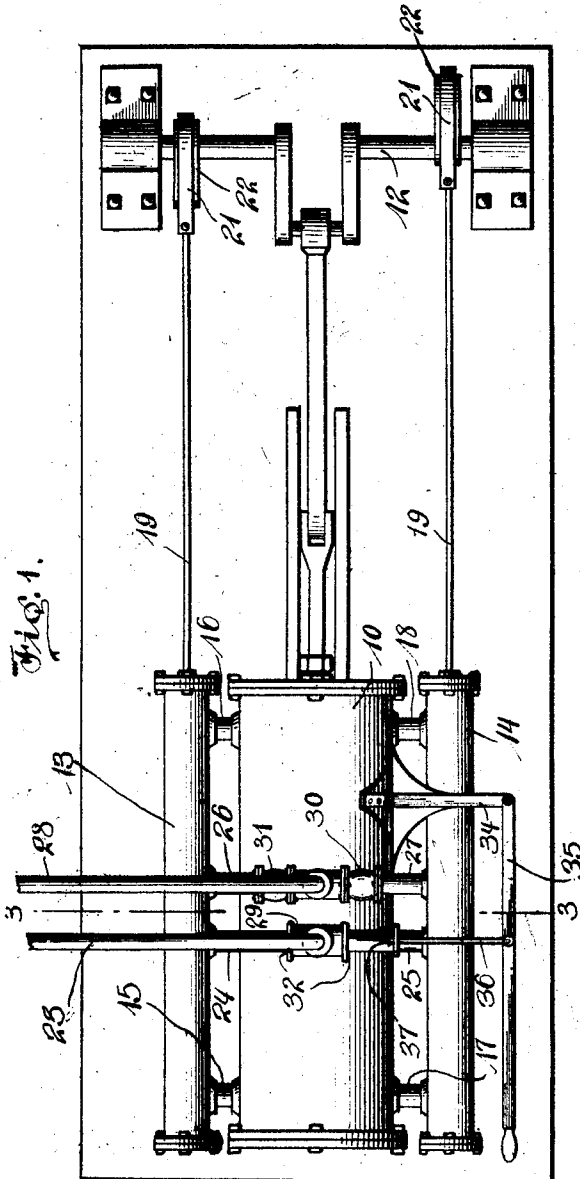


J. E. ARNOLD.
 REVERSING VALVE MECHANISM.
 APPLICATION FILED APR. 28, 1910.

1,049,640.

Patented Jan. 7, 1913.

2 SHEETS—SHEET 1.



Witnesses

Emmet Crocker
L. H. Willis

Inventor

J. E. Arnold.

By

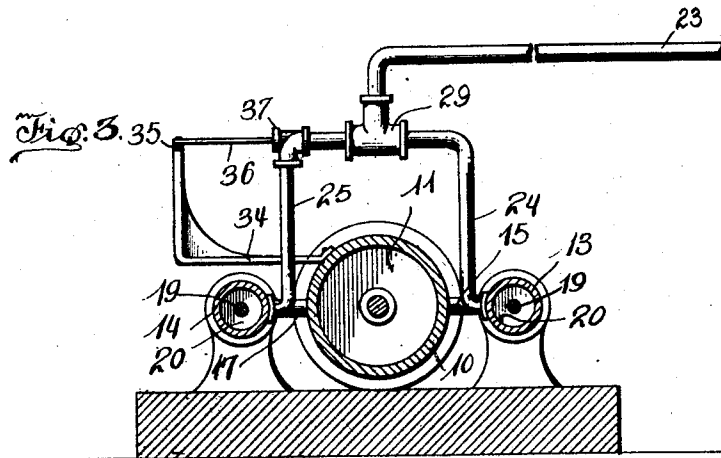
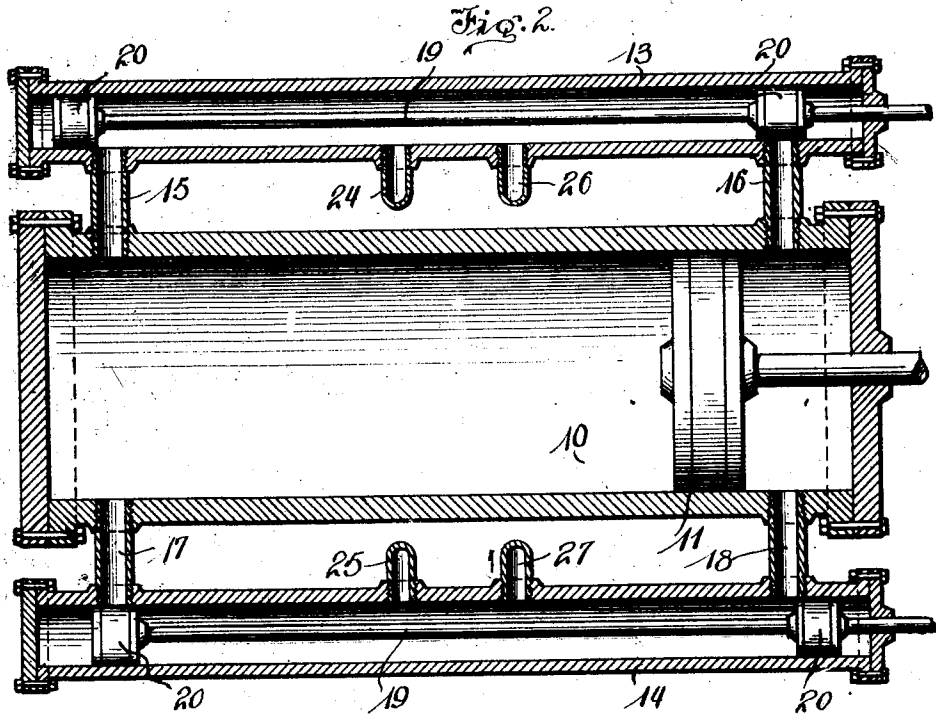
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 2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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REVERSING-VALVE MECHANISM.

1,049,640.

Specification of Letters Patent.

Patented Jan. 7, 1913.

Application filed April 23, 1910. Serial No. 558,159.

To all whom it may concern:

Be it known that I, JAMES E. ARNOLD, a citizen of the United States, residing at Grand View, in the county of Spencer, State of Indiana, have invented certain new and useful Improvements in Reversing-Valve Mechanisms; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to reversing valve mechanisms for steam engines and has for its object to provide a valve mechanism of this nature which shall be efficient in action and which shall permit the quick reversing of the engine.

More especially the invention relates to an improvement on the reversing valve mechanism for which Letters Patent of the United States were granted to me April 9, 1907, bearing the Serial No. 849,523.

The invention resides in the provision of a novel arrangement of valves in the steam supply and exhaust pipes.

The invention further consists in certain novel details of construction and combinations of parts hereinafter fully described, illustrated in the accompanying drawings, and specifically set forth in the claim.

In the accompanying drawings, like characters of reference indicate like parts in the several views, and Figure 1 is a top plan view of an engine showing the valve mechanism applied thereto. Fig. 2 is a horizontal sectional view through the cylinder and steam chests. Fig. 3 is a section on the line 3-3 of Fig. 1. Fig. 4 is a detail longitudinal section through the exhaust pipe. Fig. 5 is a similar detail longitudinal section through the steam pipe.

In the drawings, 10 denotes the engine cylinder, 11 the piston, and 12 the main shaft which is driven by the engine. Disposed on each side of the cylinder 10 are steam chests 13 and 14 which have communication with the main cylinder by means of pipes 15 and 16, and 17 and 18 respectively. Slide valves are disposed in the steam chests 13 and 14 respectively and each comprises a valve rod 19 and heads 20. The rods 19 are provided at their outer ends with eccentric straps 21 in which work on eccentrics 22 on the shaft 12, thereby providing for the reciprocation of the slide

valves when the shaft is rotated. The heads 20 are so disposed on the respective rods 19 that there will be one of these heads adjacent each end of the respective cylinder 13 or 14.

A steam pipe 23 leads from a suitable source of steam supply to the engine and is provided at its end adjacent the engine with branch pipes 24 and 25 which lead, respectively, to the steam chests 13 and 14. Branch pipes 26 and 27 lead from these respective steam chests and communicate with an exhaust pipe 28. At the junction of the steam supply pipe 23 and the branch pipes 24 and 25 is formed a valve casing 29 and in the pipes 26 and 27 adjacent their connection with the pipe 28 are formed valve casings 30 and 31. The valve casing 29 is provided with oppositely disposed valve seats 32 and the valve casings 30 and 31 with respective valve seats 33.

Extending laterally from one side of the cylinder 10 is a bracket arm 34 to the outer end of which is pivoted one end of a reversing lever 35. Pivotally connected to the lever 35 is a valve rod 36 which extends through a stuffing box 37 leading into the branch pipe 25. A valve 38 is carried by the inner end of the valve rod 36 and is arranged to seat on either of the seats 32.

Within the valve casings 30 and 31 are guides 39 through which passes a valve stem 40 having secured thereon spaced valves 41, the valves being so arranged that when one of said valves is seated on a respective valve seat 33 the other will be in spaced relation to its valve seat so that whenever one valve is open the other will be closed.

As shown in the drawings the steam inlet is through the pipe 23 to the valve casing 29. From there the steam passes, depending on the position of the valve 38, into either the branch pipe 24 or the branch pipe 25. In the first instance the steam chest 13 becomes the steam supply chest and the pressure of the steam in this chest being permitted through the pipe 26 to the valve casing 31 will cause the valves 41 to assume the position shown in Fig. 4. When the valves are in this position steam will pass out of the chest 14 through the pipe 27 to the exhaust pipe 28. If, now, the lever 35 is so moved as to change the position of the valve 38 to the opposite end of the casing 29 the pipe 25 will supply steam to the chest

14 and the pressure of steam in this chest, being in excess of the pressure of steam in the chest 13, will force the valves 41 to assume such position that the valve 41 in the casing 31 will be open and the valve 41 in the casing 30 closed.

It will be apparent from an inspection of Fig. 2 of the drawing that the end of the pipe 16 is entirely closed by the valve 20 when the opposite valve 20 has advanced beyond the end of the pipe 15. It will also be apparent that the valve 20 in the opposite steam chest closes the pipe 17, while the opposite valve 20 has passed beyond the pipe 18. This construction manifestly prevents the passage of steam into the steam pipe in the rear of the valves or pistons, thereby preventing any undesired retarding of the rods 19.

There has thus been provided a simple and efficient device of the kind described and for the purpose specified.

Having thus described the invention, what is claimed as new, is:—

In a reversing valve mechanism, the combination with an engine cylinder, steam chests arranged at each side of said cylinder and having communication with opposite

ends thereof and slide valves arranged in said steam chests and having heads controlling the adjacent orifices at said communicating points; of steam inlet pipes, a common valve chamber having communication with said inlet pipes; said inlet pipes communicating with said steam chests, a steam exhaust pipe leading from said steam chests, a valve chamber in each of said exhaust pipes, a manually controlled valve in the valve chamber of the inlet pipes to cut off the supply thereto or discharge the steam into either pipe, apertured guides in the valve chambers of the exhaust ports, a stem slidable therein, oppositely disposed seats in the chambers and oppositely disposed valves carried by the stem to automatically seat therein under the supply pressure by reversing the supply valve whereby one valve will be closed and the other opened to oppositely exhaust the steam.

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

JAMES E. ARNOLD.

Witnesses:

GEORGE N. LOGAN,
JOHN D. BEARD.