

(No Model.)

S. M. VAUCLAIN.
STARTING VALVE FOR COMPOUND ENGINES.

No. 499,066.

Patented June 6, 1893.

FIG. 1.

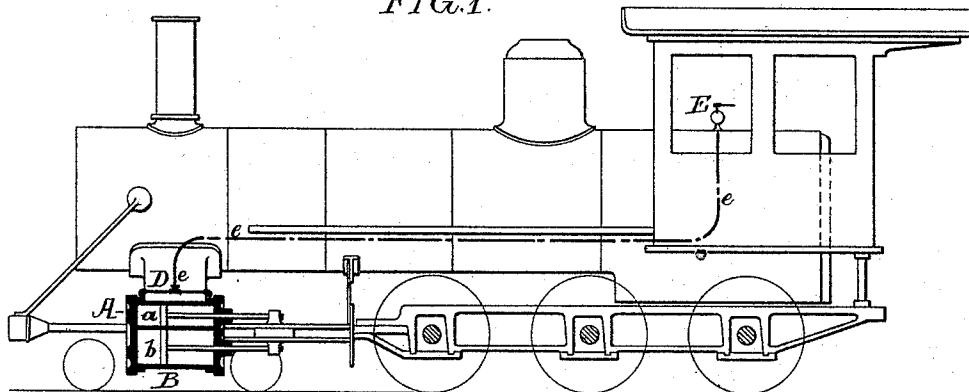


FIG. 2.

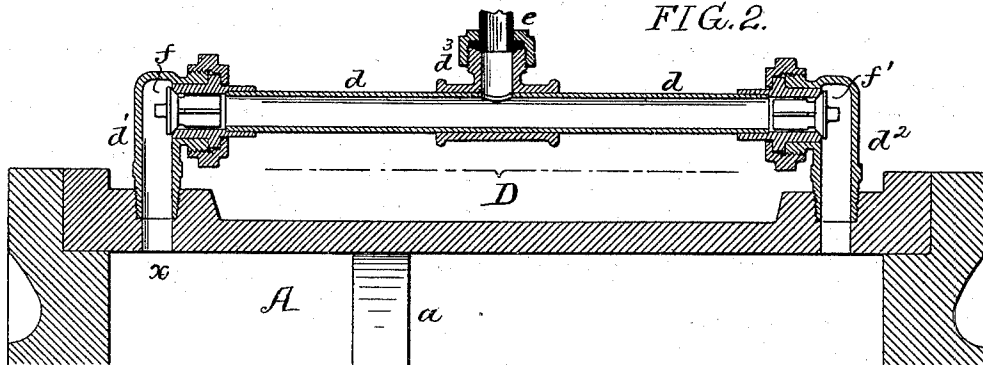


FIG. 4.

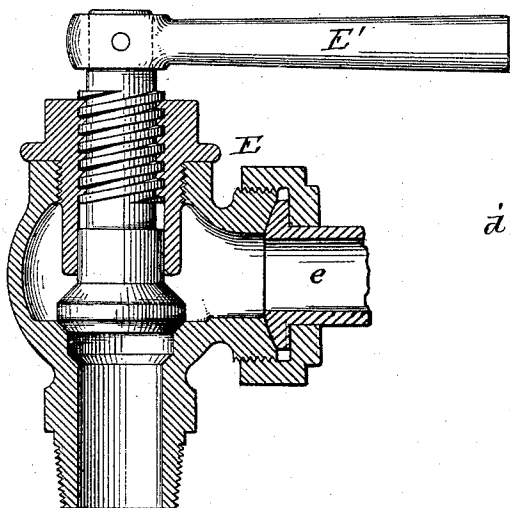
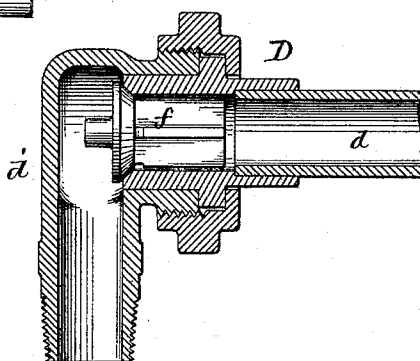


FIG. 3.



Witnesses:
Hamilton D. Turner.
A. V. Groupe

Inventor:
Samuel M. Vauclair
by his Attorneys
Howman & Howman

UNITED STATES PATENT OFFICE.

SAMUEL M. VAUCLAIN, OF PHILADELPHIA, PENNSYLVANIA.

STARTING-VALVE FOR COMPOUND ENGINES.

SPECIFICATION forming part of Letters Patent No. 499,066, dated June 6, 1893.

Application filed December 7, 1891. Serial No. 414,278. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL M. VAUCLAIN, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented an Improved Starting-Valve for Compound Engines, of which the following is a specification.

The object of my invention is to so construct a compound engine that steam may be admitted on starting, to both the high and low pressure cylinders of the engine by the simple manipulation of the engineer's starting valve, which is at a convenient point in the cab of the locomotive. This object I attain in the following manner, reference being had to the accompanying drawings, in which—

Figure 1, is a side view partly in section of a locomotive engine illustrating my invention. Fig. 2 is a longitudinal sectional view of a portion of the high pressure cylinder and connecting passage. Fig. 3, is an enlarged view of one of the check valves at the cylinder; and Fig. 4, is a view of the preferred form of the engineer's starting valve.

A is the high pressure cylinder.

B is the low pressure cylinder of the locomotive engine, having pistons *a* and *b* preferably coupled as shown in Fig. 1. The arrangement shown in the said figure is similar to that described and claimed in former United States patents granted to me, but it will be understood that other arrangements of the cylinder may be used, without departing from my invention.

I would say at the outset that it is desirable when starting a compound locomotive, to start with both the high and the low pressure cylinders as high pressure cylinders, and the special arrangement of parts claimed by me in this application is for the purpose of carrying out this object.

Connected to each end of the high pressure cylinder A is a pipe D made up in the present instance of sections *d'*, *d*². The section *d* is connected by a T-coupling to a tube *e* which extends to the engineer's starting valve E, clearly shown in Fig. 4, which is preferably within easy reach of the engineer, in the cab of the locomotive, as shown in Fig. 1.

This starting valve is connected with a steam space of the boiler. In each section *d'*, *d*², of the pipe D are check valves; in the section *d'* is a check valve *f* and in the section *d*² is a check valve *f'*. These check valves are so situated that any pressure in the cylinder A will tend to close the valves, a larger area being exposed to pressure from the cylinder than to pressure from the tube *e*, as clearly shown in the drawings.

When starting a locomotive the ordinary throttle valve is operated at the same time the engineer's starting valve is opened by turning the handle E', admitting steam to the tube *e* and pipe *d*. Thus steam pressure is exerted upon the small faces of the two check valves *f*, *f'*. If the main cylinder valve is so set that steam will flow into the forward end *x* of the cylinder A, it will place full boiler pressure upon the larger surface of the check valve *f*, closing it against any pressure exerted through the starting valve and its pipe, but the opposite end of the cylinder being open to the low pressure cylinder, the steam admitted through the starting valve and its pipes will force the check valve *f'* open, allowing steam to pass through the pipe *d* and section *d*² to the exhaust side of the high pressure cylinder. This steam will consequently pass through the exhaust port to the opposite side of the low pressure cylinder, and at a reduced pressure owing to the arrangement of parts. Thus both pistons are actuated by high pressure steam. After an exhaust has been made, the starting valve E is closed when the pressure in the cylinder will close the check valve *f'*, and the engine will run compounding, both check valves assuming the position shown in Fig. 2. I am thus enabled to considerably reduce the parts and simplify the construction of the mechanism for introducing high pressure steam, when wanted in starting the locomotive, to the low pressure cylinder.

I claim as my invention—

In a compound engine, the combination of the high and low pressure cylinders of the pipe D, having at each end sections *d'*, and *d*², communicating with each end of the high

pressure cylinder, a check valve in each section, with a pipe *e*, connected to the tube *d*, between the check valves, and extending into the cab and provided at its end with a separate engineer's valve E, said tube and pipe
5 forming an independent steam supply for starting, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SAMUEL M. VAUCLAIN.

Witnesses:

FRANK H. MASSEY,
KENNETH RUSHTON.