GEORGE F. BLAKE.

Improvement in Steam Engines.

No. 123,765. Patented Feb. 20, 1872.

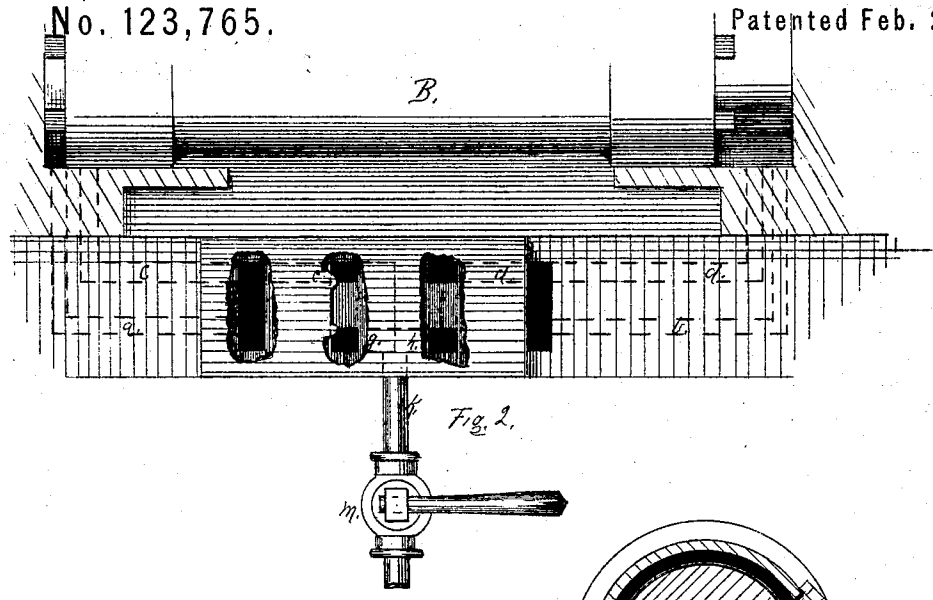

Fig. 2.

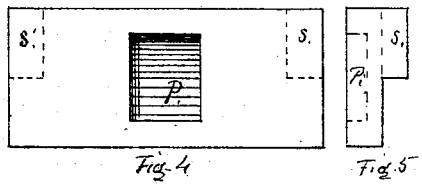

Fig. 4

Fig. 5

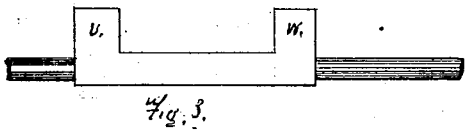

Fig. 3.

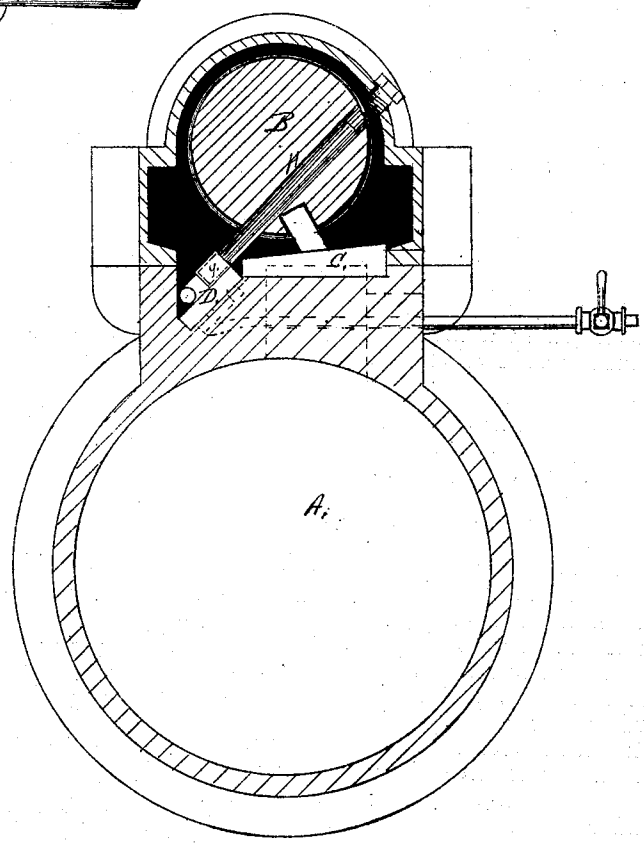

Fig. 1.

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Witnesses
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GEORGE F. BLAKE, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN VALVES FOR DIRECT-ACTING ENGINES.

Specification forming part of Letters Patent No. 123,765, dated February 20, 1872; antedated February 15, 1872.

I, GEORGE F. BLAKE, of Boston, county of Suffolk, Commonwealth of Massachusetts, have invented certain Improvements in Valves for Direct-Acting Engines, of which the following is a specification:

My invention relates to that class of direct-acting engines known as automatic. My improvements consist, first, in a new and improved arrangement of ports for admitting steam to and exhausting it from the plunger and cushioning the same, and an improved arrangement of the passages leading to the plunger-cylinder from said ports; second, in the arrangement of a pin for moving the plunger by and with the secondary valve at certain times; third, in an improved method of regulating the speed of the plunger carrying the main slide-valve.

In the drawing accompanying these specifications, Figure 1 is a section showing the general arrangement of cylinder, valve-chest, valves, and plunger. Fig. 2 shows the arrangement of the secondary slide-valve, with its ports, passages, and cock for regulating the exhaust from the plunger. Fig. 3 shows the end of the valve-rod which operates the secondary slide-valve. Figs. 4 and 5 are, respectively, face and end views of the secondary or auxiliary slide-valve, shown over its ports in Fig. 2.

General Description.

A is the main cylinder of the engine; B, the plunger. C is the main slide-valve, and D the secondary or auxiliary valve. The ports *a b* lead directly to the ends of the plunger-cylinder, as shown in Fig. 2. The ports *c d* also lead to the ends of the plunger-cylinder, but enter it a short distance inward from the entrance of ports *a b*, forming a cushion by the plunger traveling over and closing the exhaust from the ports *c d*, as will be seen from a further description. The ports *g h* communicate with the small secondary exhaust-pipe *k*, which has attached the regulating-cock *m*. The secondary slide-valve face has one cavity, P, and is generally of the ordinary D-valve variety. On its back it has projections *s s'*, between which the projections *v w* on the end of the valve-rod fit. The pin H passes through the body of the plunger, and its end *j* plays between the projections *v w* on the valve-rod, when the parts are together, as shown in Fig. 1. In operation, the secondary valve, acted on by the valve-rod, operated by a tappet-rod or similar means, exposes port *a* to the steam above the valve, and at the same time uncovers ports *c* and *g* into the cavity P in the secondary valve, so as to connect the same with each other and form a passage from one end of the plunger-cylinder into the exhaust-pipe *k*, and from the steam in the valve-chest to the other end of the plunger-cylinder, and, on reversing, exposes the opposite ports in the same manner, thus operating the plunger. The pin H has sufficient play between the projections *v w* on the valve-rod, so that if the plunger travels with sufficient rapidity these projections do not touch the pin; but if it move slower than the main piston carries the valve-rod, one of these projections *v w* catches it and carries it along, and with it the plunger and main slide-valve, thus causing the pump to reverse before the main piston can, by any possibility, strike the cylinder-head.

The secondary slide-valve is arranged, as shown, in connection with its valve-rod, so as to be readily removed without disturbing the latter.

In slow-running pumps, it is necessary to regulate the movement of the plunger so that the pump may not reverse too suddenly. This I accomplish by means of the cock *m* on the exhaust-pipe *k;* for by closing the same more or less any desired speed may be given to the plunger, as it can only move as fast as the escape of its exhaust will allow it.

I claim as my invention—

1. The plunger B, constructed as described, and operated, by means of the cock *m* on the exhaust-pipe *k*, as set forth.

2. The arrangement of ports *a b c d g h* with the slide-valve D, constructed and operating substantially as described.

3. The arrangement of projections *s s'* on valve-rod, and projections *v w* on valve D, constructed and operating substantially as set forth.

4. The arrangement of the pin H, in combination with the plunger B and secondary slide D, substantially as set forth.

The foregoing specification signed and witnessed at Washington this 9th day of June, A. D. 1871.

GEO. F. BLAKE.

Witnesses:

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