(No Model.)

S. L. FRENCH & J. ANDERSON.

FORCE PUMP ATTACHMENT.

No. 248,032. Patented Oct. 11, 1881.

Fig. 1.

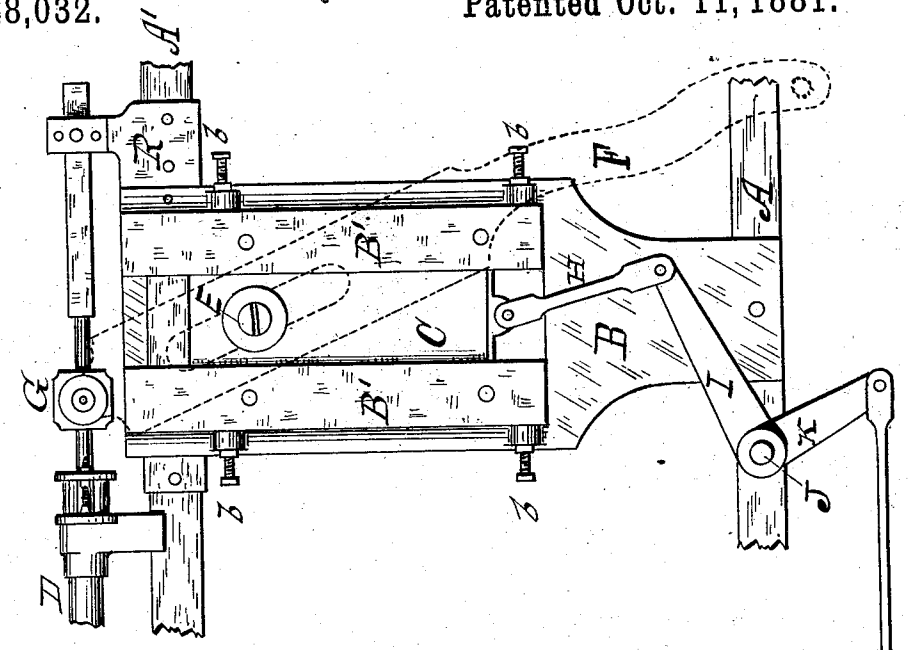
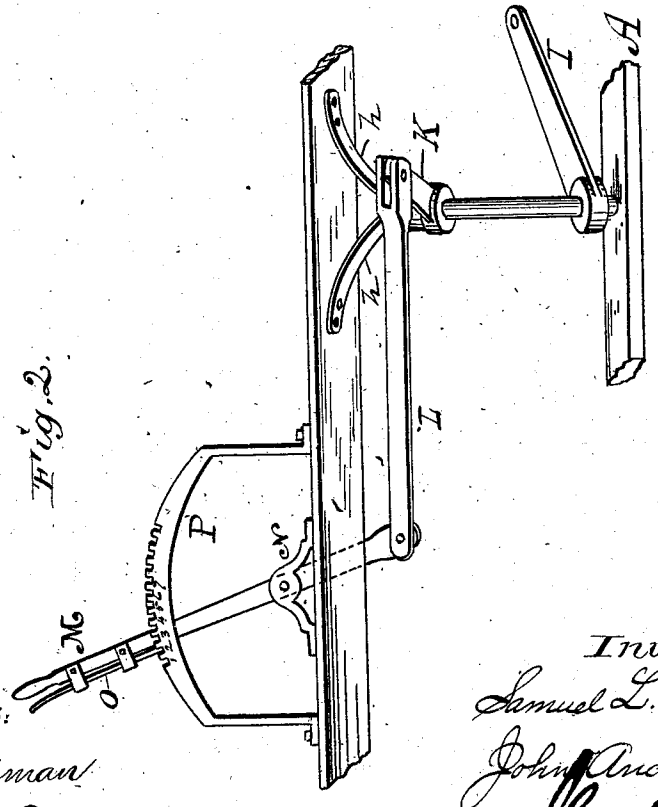


Fig. 2.



Witnesses:
M. F. Crossman
E. B. Stocking

Inventors:
Samuel L. French
John Anderson
By. Atty.

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

SAMUEL L. FRENCH AND JOHN ANDERSON, OF LIGONIER, PENNSYLVANIA.

FORCE-PUMP ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 248,032, dated October 11, 1881.

Application filed August 17, 1881. (No model.)

To all whom it may concern:

Be it known that we, SAMUEL L. FRENCH and JOHN ANDERSON, citizens of the United States of America, residing at Ligonier, in the county of Westmoreland and State of Pennsylvania, have invented certain new and useful Improvements in an Attachment for Force-Pumps; and we 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a plan view, and Fig. 2 is a detached perspective of a portion of Fig. 1.

Like letters refer to like parts in both figures.

This invention relates to certain means for regulating the stroke of the piston-rod and piston of a force-pump and is an improvement on the patent granted to Samuel L. French, No. 233,667, and dated October 26, 1880.

The object of this improvement is to provide a means of controlling the amount of water supplied by a force-pump when employed in connection with and for the purpose of feeding a locomotive or other steam-boiler; and it consists in certain combinations of devices which are hereinafter described, and specifically set forth in the claims. Heretofore this result has been accomplished by means of slotted levers pivoted at one end to a frame arranged above the pump and steam-engine, between which is arranged a single lever, also hinged at one end in combination with a rod provided with slides working in the slots in levers, and said slides adjusted by a screw having its bearing upon the end of the interposed lever. It has also been in a measure accomplished by means of mechanism well known as the "Stephenson link-connection," which controlled the supply of steam in the cylinders of the locomotive, the piston-rod of the feed-pump having pistons within the said cylinders and therefore affected in its operation by the supply of steam thus controlled, each being jointly and simultaneously controlled. On the contrary, in our improvement as herein set forth the supply of water to the boiler is controlled independently of the supply of steam to the cylinders.

A A′ represent the frame of a locomotive with our improvements mounted thereon; B, a bed-plate bolted in any suitable manner to said frame, and having gibs or ways B′, provided with set-screws *b*, in which is fitted the fulcrum-block C, provided with an anti-friction roller, as in the patent above referred to, which is dovetailed to snugly fit the ways B′ and move from end to end therein in the usual manner.

The block C is provided with a vertical fulcrum pin or stud, E, over which passes a slotted lever, F. The forward end of this slotted lever F is pivoted to a block, G, adjustably attached to the plunger-rod of the force-pump, the pipe D of said pump only being shown in the drawings. The other end of the slotted lever is connected by means of jointed arms to the cross-head of the steam-engine, as clearly shown and explained in the patent above referred to.

At the back end of fulcrum-block C is pivotally attached a connecting-rod, H, its other end being pivotally attached to an arm, I, firmly secured to an upright shaft, J, resting in suitable bearings upon the frame A, and supported at its upper end in a bearing made in brackets *h h*, attached to the under side of the running-board of the locomotive.

At the upper part of upright shaft J is secured rigidly a second arm, K, projecting at a right angle to arm I, which arm K is connected pivotally to rod L, and this in the same manner to the operating-lever M, pivoted in bearings N on the floor of the locomotive-cab, and extending upward within easy access to the engineer.

To the lever M is attached the spring-catch O, of usual construction, adapted to be dropped into any of the nicks or slots of the arch P, also secured to the floor of the cab, which arch may indicate by figures at the slots the quantity of water supplied by the pump when the lever is in certain positions.

The outward end of the piston-rod or plunger of the pump is made square for strength and steadiness of operation, and passes through a bracket, R, supported in any suitable manner on the frame A′.

Operation: As the cross-head of the engine moves with its piston it will give a movement to the slotted lever, which, in turn, will move the plunger of the force-pump. By adjusting the block C inwardly on the transverse plate B and ways B′ the stroke of the plunger is shortened and the supply of water to the boiler is diminished, and by adjusting the block C in the opposite direction the length of the stroke is increased and the amount of water forced into the boiler is correspondingly enlarged, and this without reference, *per se*, to the amount of steam consumed in the cylinders of the locomotive. Hence by this adjustment a well-supplied boiler yielding sufficient steam for consumption by the cylinders when working rapidly and under a heavy load may be gradually and moderately supplied with water independent of the energetic and rapid work of the piston and cross-head; or the boiler may be rapidly filled when the piston is working either slowly or rapidly, and a uniform, steady supply of water may be had at any and all times, irrespective of the speed or work accomplished by the locomotive, the time employed in furnishing the supply, and the quantity of supply in a given time being directly under the control of the engineer. Suppose the locomotive with its ordinary train is traveling at moderate speed, the boiler well filled, and the cylinders consuming a normal amount of steam. The operating-lever M stands upright, with the catch O in the central slot of the arch P. The water in the boiler is discovered to be low. The engineer throws the operating-lever to the front. This draws lever K to the rear and lever I outwardly, and this draws the fulcrum-block C and the fulcrum E away from block G, thus lengthening the inner arm of lever F, causing its movement at the inner end to be through a greater distance, thus increasing the length of the stroke of the plunger, and consequently the supply of water to the boiler. The reversal of these movements produces a contrary effect.

Having shown and described the invention, what we claim as new, and wish to secure by Letters Patent, is—

1. The combination, with the plunger of a force-pump, of the slotted lever, the sliding fulcrum-block, and means, substantially as shown and described, for securing said block in desired position, a shaft provided with rigidly-connected arms, the one placed at a right angle to the other, the connecting-levers, and the operating-lever, all substantially as shown and described.

2. In combination with the frame of a locomotive, the bed-plate B, provided with the ways B′, the fulcrum-block C, having fulcrum E, slotted lever F, and block G, connecting-rod H, arm I, and shaft J, with means, substantially as shown and described, for operating said arm, as and for the purpose set forth.

3. The combination of the operating-lever M, having catch O, slotted arch P, lever L, shaft J, arms K I, rod H, fulcrum-block C, lever F, and block G, substantially as shown and described.

In testimony whereof we have affixed our signatures in presence of two witnesses.

SAMUEL L. FRENCH.
JOHN ANDERSON.

Witnesses:
JNO. Q. A. BUSTED,
H. BLACK.