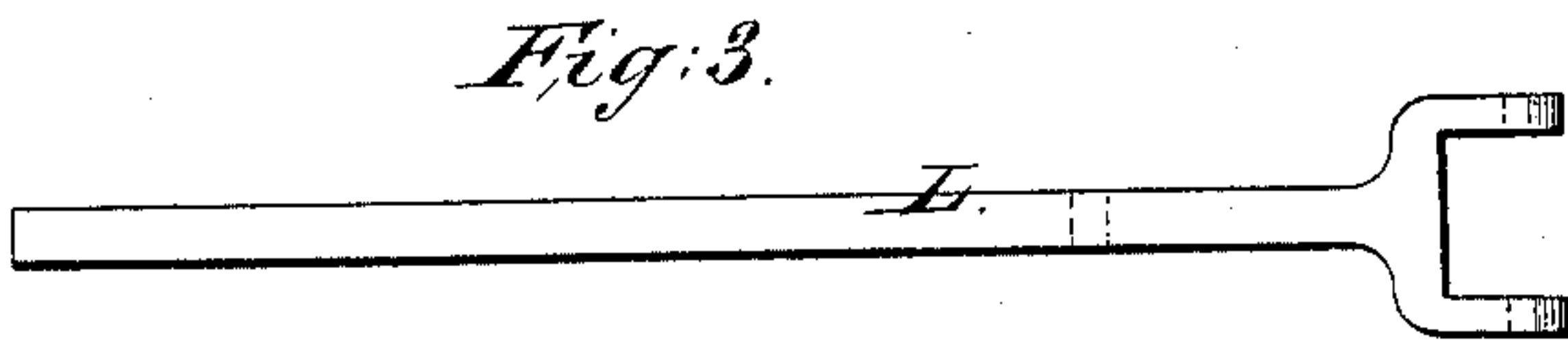
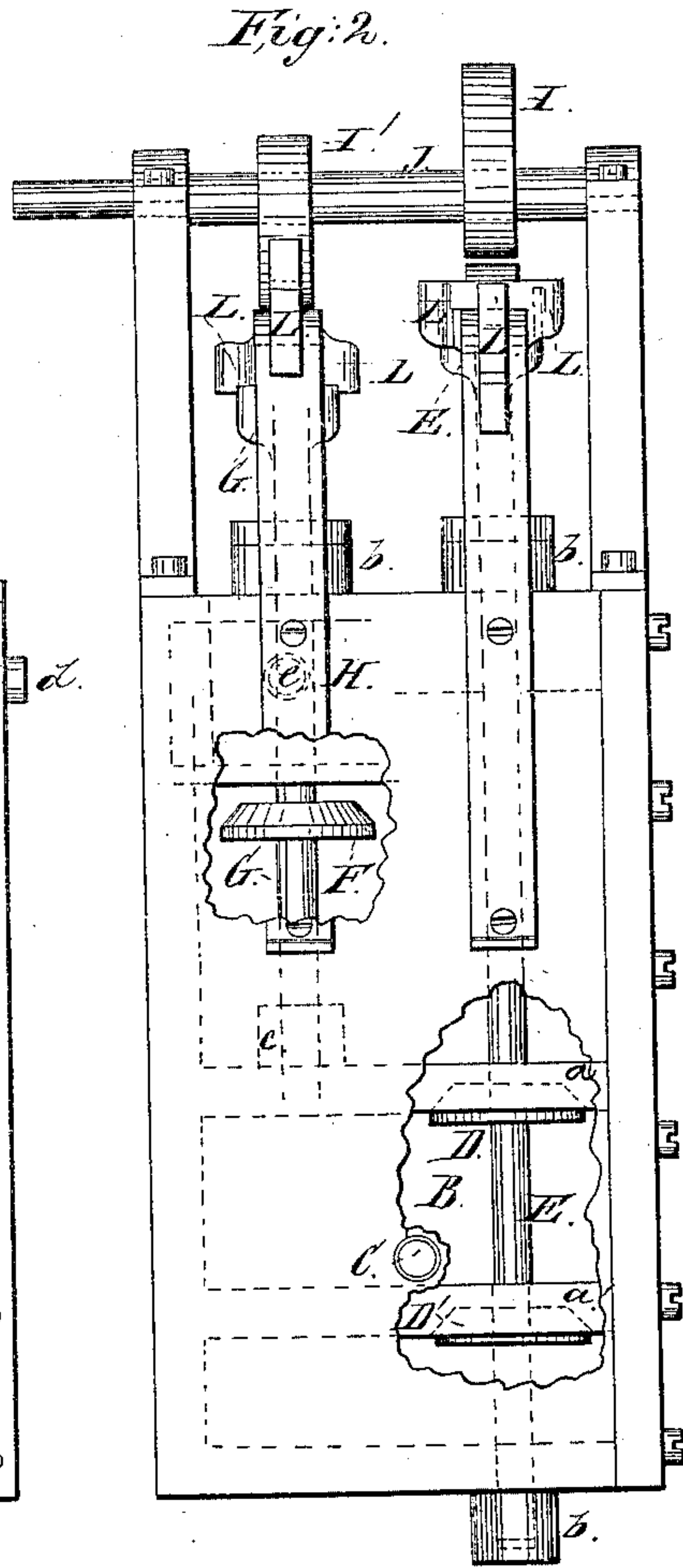
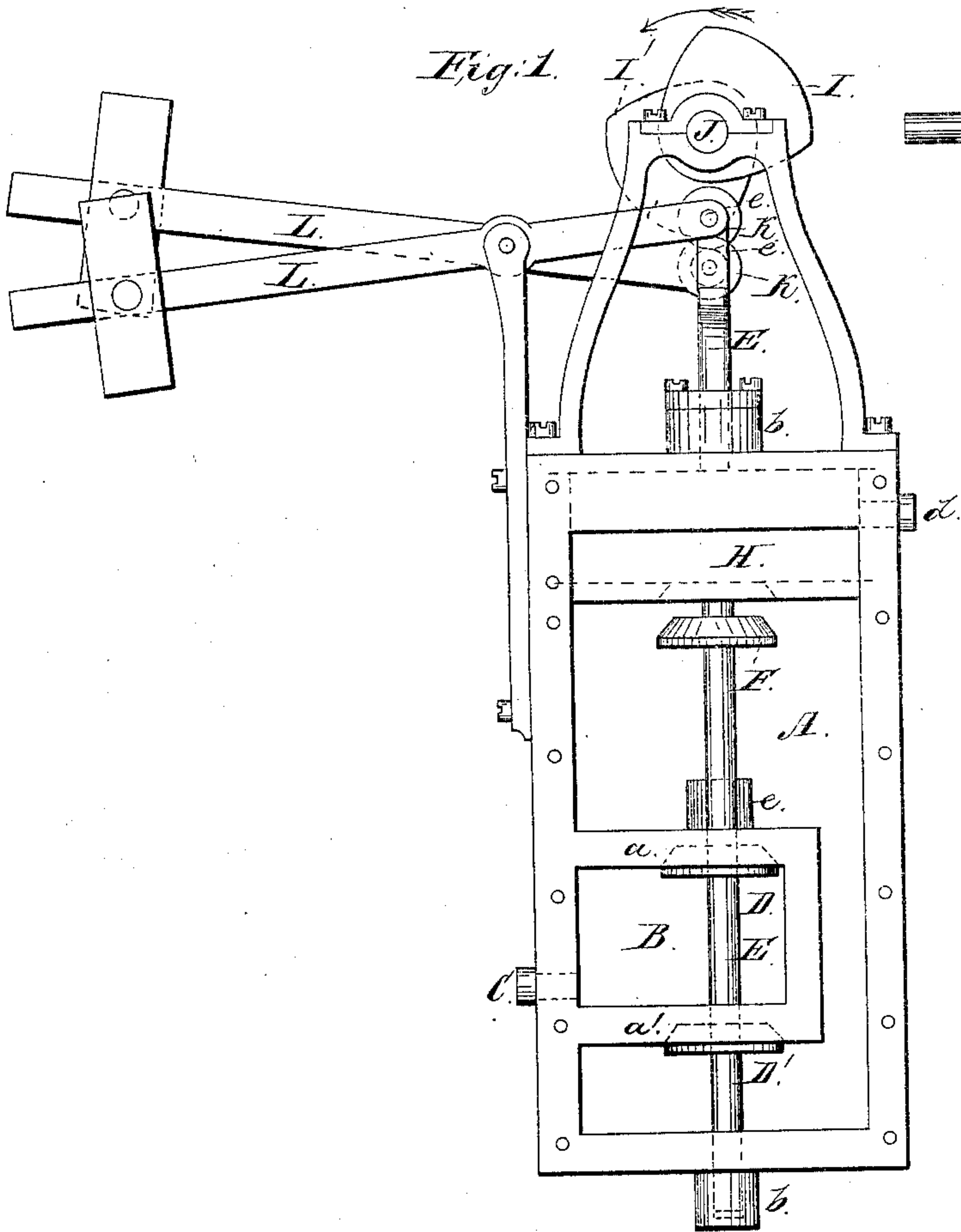


*S. Driver,*

*Steam-Boiler Water-Feeder,*

*No. 49,949,*

*Patented Sep. 12, 1865.*



*Witnesses:*

*Stephen Ustick  
Edward Williams*

*Inventor:*

*Samuel Driver*

# UNITED STATES PATENT OFFICE.

SAMUEL DRIVER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND EDWARD LONGAN, OF SAME PLACE.

## IMPROVEMENT IN AUTOMATIC BOILER-FEEDERS.

Specification forming part of Letters Patent No. **49,949**, dated September 12, 1865.

*To all whom it may concern:*

Be it known that I, SAMUEL DRIVER, of the city and county of Philadelphia, and State of Pennsylvania, have invented an Improved Automatic Water-Feeder for Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a side elevation of the apparatus. Fig. 2 is a front view of the same with the counter-weights left off the levers L L. Fig. 3 is a top view of one of the levers.

Like letters in all the figures indicate the same parts.

The nature of my invention consists in combining and arranging with the feed-pipe and boiler an intermediate water-receiver, which automatically keeps up a constant supply of water to the boiler, the apparatus being constructed, arranged, and operating substantially as follows:

A is a cast-iron box, which I confine to the top of the boiler or locate in any other convenient place. Within the box A there is a chest, B, which communicates with the water-line in the boiler by means of a pipe leading from the opening C, through which the water is caused to descend to keep up a regular supply of water to the boiler, as will be hereinafter described.

There are balance-valves D D' on the vertical rod E, which have their seats in the top and bottom plates, *a a'*, of the chest B, the said rod E working in the stuffing-boxes *b b*. There is a valve, F, on the vertical rod G, which is provided with stuffing-boxes *c c*. The said valve is for opening and closing the communication between the feed-pipe and the box A its seat being in the bottom of the chest H, with which the feed-pipe is connected by means of the opening *d*. The valves D D' have an alternate movement with the valve F, the said valve being actuated by the cams I I' on the horizontal shaft J, which is geared in any convenient manner with the driving-shaft of the engine, there being friction-wheels K K on the upper ends of the rods E G. Counter movements are given to the valve-rods by means of

the weighted levers L L, which are connected therewith by means of the pins *e e*, on which the friction-wheels K K work.

The operation is as follows: As the cam-shaft J revolves in the direction of the arrow the cams I I' give a reciprocal motion to the balance-valves D D' and the valve F the cam I opening and closing the valves D D' and the cam I' opening and closing the valve F. When the valve F is open, as seen in Figs. 1, 2, there is an open communication between the feed-pipe and the box A, and the communication at that time with the boiler by means of the chest B is closed by the valves D D', and by a reverse position of the valves D D' and F the communication with the boiler is opened and the communication with the feed-pipe is closed; and so on successively, the valves continue to operate, so that the water may descend from the feed-pipe into the box A, and thence through the chest B into the boiler, by the alternate opening of the valves D D' with the valve F. This action takes place whenever the water in the boiler gets below the water-line in consequence of the steam rushing up the communicating pipe into the chest B, and being condensed by the water from the box A at every opening of the valves D D', which water then descends to replenish the boiler. But when the water in the boiler rises to the water-line this action cannot take place, because the steam in the upper part of the boiler then presses the water up the said pipe and into the chest B and overcomes the weight of the water. Consequently there will be but a slight variation of the depth of water in the boiler at all times.

The valves will open and close by the action of the cams without supplying the boiler with water until by the generation of steam the surface of the water descends below the water-line. Then the refilling of the boiler will again take place, as above described. Thus the boiler will constantly be supplied with water automatically as needed without the use of a pump or injector. The apparatus feeds hot water equally as well as cold water, and one of proper capacity to fill a boiler of a certain size will answer for any smaller size boiler.

Having thus fully described my improved



automatic water-feeder for steam-boilers, what I claim therein as new, and desire to secure by Letters Patent, is—

1. Combining the feed-pipe with the boiler by means of the box A and chests B H, arranged and operating substantially as described, and for the purpose set forth.

2. The combination and arrangement of the valves D D' with the chest B, for opening and closing the communication between the box A and the boiler, substantially as described.

3. Combining and arranging the cams I I' with the valves D D' and F, substantially as and for the purposes set forth.

In testimony that the above is my invention I have hereunto set my hand and affixed my seal this 9th day of August, 1865.

SAMUEL DRIVER. [L. s.]

Witnesses:

STEPHEN USTICK,  
EDWARD WILLIAMS.