

No. 672,427.

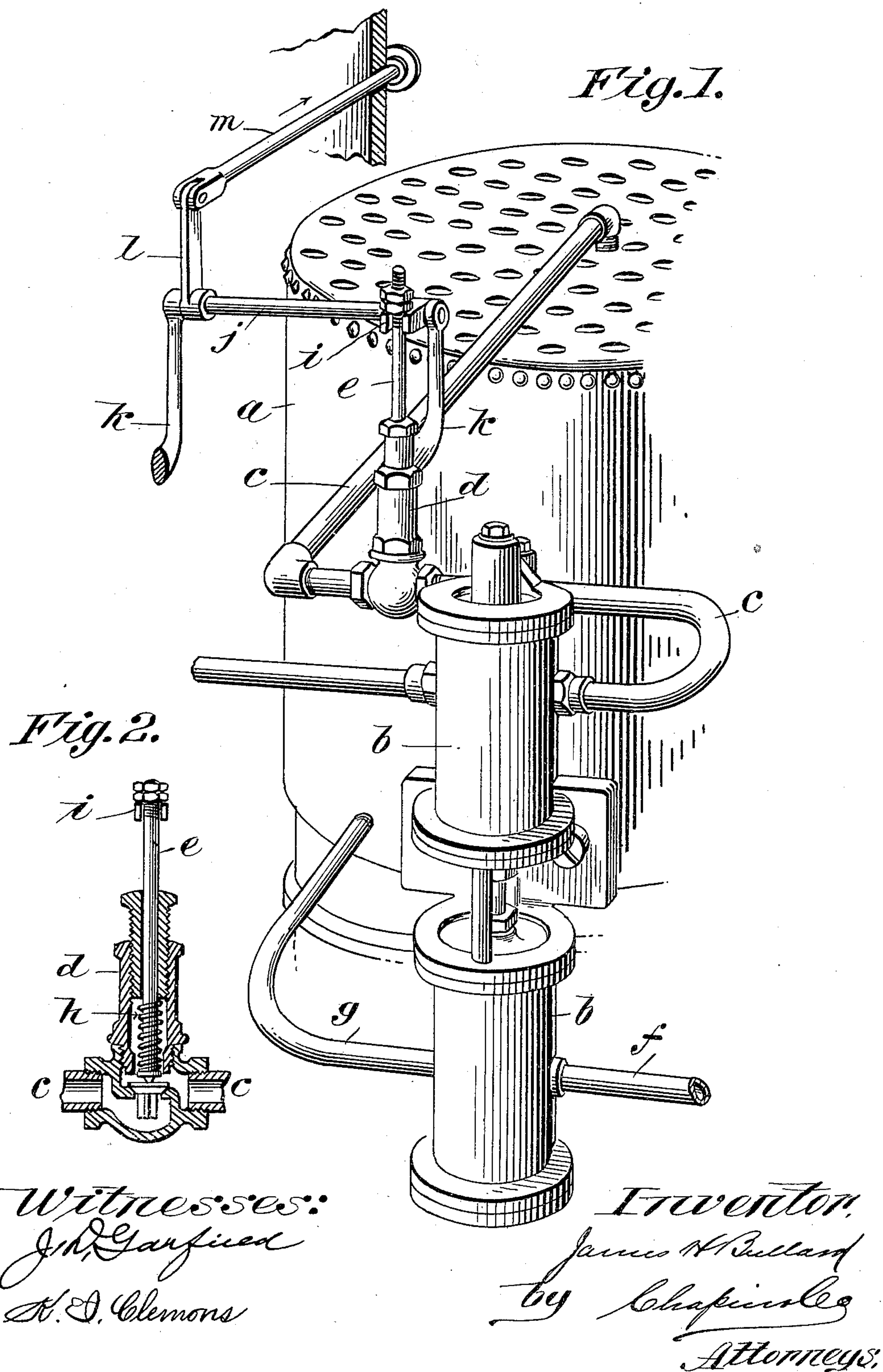
Patented Apr. 16, 1901.

**J. H. BULLARD.**

## BOILER FEEDER.

(Application filed Aug. 1, 1900.)

(No Model.)





# UNITED STATES PATENT OFFICE.

JAMES H. BULLARD, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR TO  
OVERMAN AUTOMOBILE COMPANY, OF CHICOPEE, MASSACHUSETTS.

## BOILER-FEEDER.

SPECIFICATION forming part of Letters Patent No. 672,427, dated April 16, 1901.

Application filed August 1, 1900. Serial No. 25,555. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES H. BULLARD, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Boiler-Feeders, of which the following is a specification.

This invention relates to boiler-feeding devices, and has for its object the improvement in valve-operating means whereby a suitable boiler-feeding device may be made to feed water into a boiler; and the invention consists in adapting a valve to be operated either by automatic or manual means, one independently of the other, for effecting the feed of water to the boiler, all as clearly set forth in the following specification and pointed out in the claims forming a part thereof.

The construction embodying this invention is adapted especially for use on steam-driven vehicles. When used on such vehicles, one of the pumps for feeding water to the boiler is adapted to be set in motion by an excess of steam-pressure in the boiler, whereby said pressure may be reduced by the injection of cold water into the boiler rather than by permitting the steam to blow it into the air. By this means quite a saving of water is effected, and as the carrying capacity of these vehicles is limited this is an important feature. However, it frequently happens that for one reason or another it becomes desirable to operate this steam-actuated feed-pump independently of the pressure in the boiler, and therefore means are provided for manually operating the valve in the pipe leading to the steam-pump, whereby the latter may be set in operation.

In the drawings forming part of this application, Figure 1 is a perspective view of a boiler and a steam-actuated feed-pump and the various connections therewith embodying this invention. Fig. 2 is a somewhat-enlarged sectional elevation of the controlling-valve of the feed-pump.

Referring to the drawings, *a* indicates a steam-boiler; *b*, a steam-actuated feed-pump; *c*, a steam-pipe leading from the boiler to the pump; *d*, a valve which controls the move-

ment of said feed-pump and which closes by a downward movement of the stem, which is indicated by *e*.

*f* indicates the suction-pipe from the pumping-cylinder, which pipe extends to some suitable source of water-supply. (Not shown.)

*g* is a pipe running from the pumping-cylinder to the boiler.

Referring now to Fig. 2, which shows the valve *d* in sectional elevation, it will be observed that the stem *e* of said valve is provided with a spiral spring *h*, which normally maintains the valve in a closed position, and the strength of said spring *h* is such that it will yield only under a maximum pressure of steam in the boiler. When this pressure is reached, the valve will be forced from its seat, and steam from the boiler will have a free passage through the pipe *c* to the steam-cylinder of the steam-pump, and the latter will be set in motion and so remain until the pressure in the boiler drops below the maximum. The pump during this operation forces water through the pipe *g* into the boiler.

The spring *h* of the valve *d* extends upwardly above the latter a certain distance and is engaged by a forked arm *i*, which is secured on a rock-shaft *j*, supported in two arms *k*, one of which is cast on the valve-body *d* and the other secured to some fixed support.

On the end of the valve-stem *e* which projects above the forked arm *i* an adjusting-nut is applied, with the under side of which said forked arm engages, whereby when said rock-shaft *j* is oscillated the said arm *i* may lift the valve-stem *e* against the resistance of the spring *h*, and thus permit steam to enter the steam-cylinder of the feed-pump.

Means for oscillating the shaft *j* consist of an arm *l*, secured thereto, with which a rod *m* has a pivotal engagement, and which rod extends to some point more or less remote from the boiler. It is obvious that by moving the rod *m* in the direction of the arrow indicated thereon the valve *d* may be opened at any time at the will of the operator regardless of the degree of pressure in the boiler. It is also obvious that whenever the pressure of



steam under the valve *d* opens the latter the stem will have an unobstructed movement in the forked arm *i*.

The means shown herein for manually operating the valve *d* is only one of a number of constructions that might be devised for that purpose, and I do not confine myself to the construction specifically described above.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. The combination with a steam-boiler of a steam-actuated pump, a steam-pipe from said boiler to said pump, an automatic valve in said steam-pipe adapted to be opened by an excess of steam-pressure in the boiler, whereby said pump may be actuated and water may be forced into the boiler, and means for operating said valve independently of the pressure in the boiler, substantially as described.

2. The combination with a steam-boiler of a feed-pump therefor, a pipe from the pump to the boiler, a valve in said pipe whereby the feeding of water to the boiler is controlled, means for automatically opening said valve by an excess of pressure in the boiler, and

means for manually operating said valve independently of said automatic means, substantially as described.

3. The combination with a steam-boiler of a feed-pump therefor, a pipe from the pump to the boiler, a valve in said pipe whereby the feeding of water to the boiler is controlled, means for automatically opening said valve by an excess of pressure in the boiler, a rock-shaft, an arm thereon operatively engaging said valve, and means for oscillating said shaft for operating said valve manually, independently of said automatic means, substantially as described.

4. The combination with a steam-boiler of a feed-pump therefor, a pipe from the pump to the boiler, a valve in said pipe whereby the feeding of water to the boiler is controlled, which valve is held to its seat by a spring and is adapted to be raised by an excess of pressure in the boiler, and means for manually operating said valve, independently of said boiler-pressure, substantially as described.

JAMES H. BULLARD.

Witnesses:

WM. H. CHAPIN,  
K. I. CLEMONS.