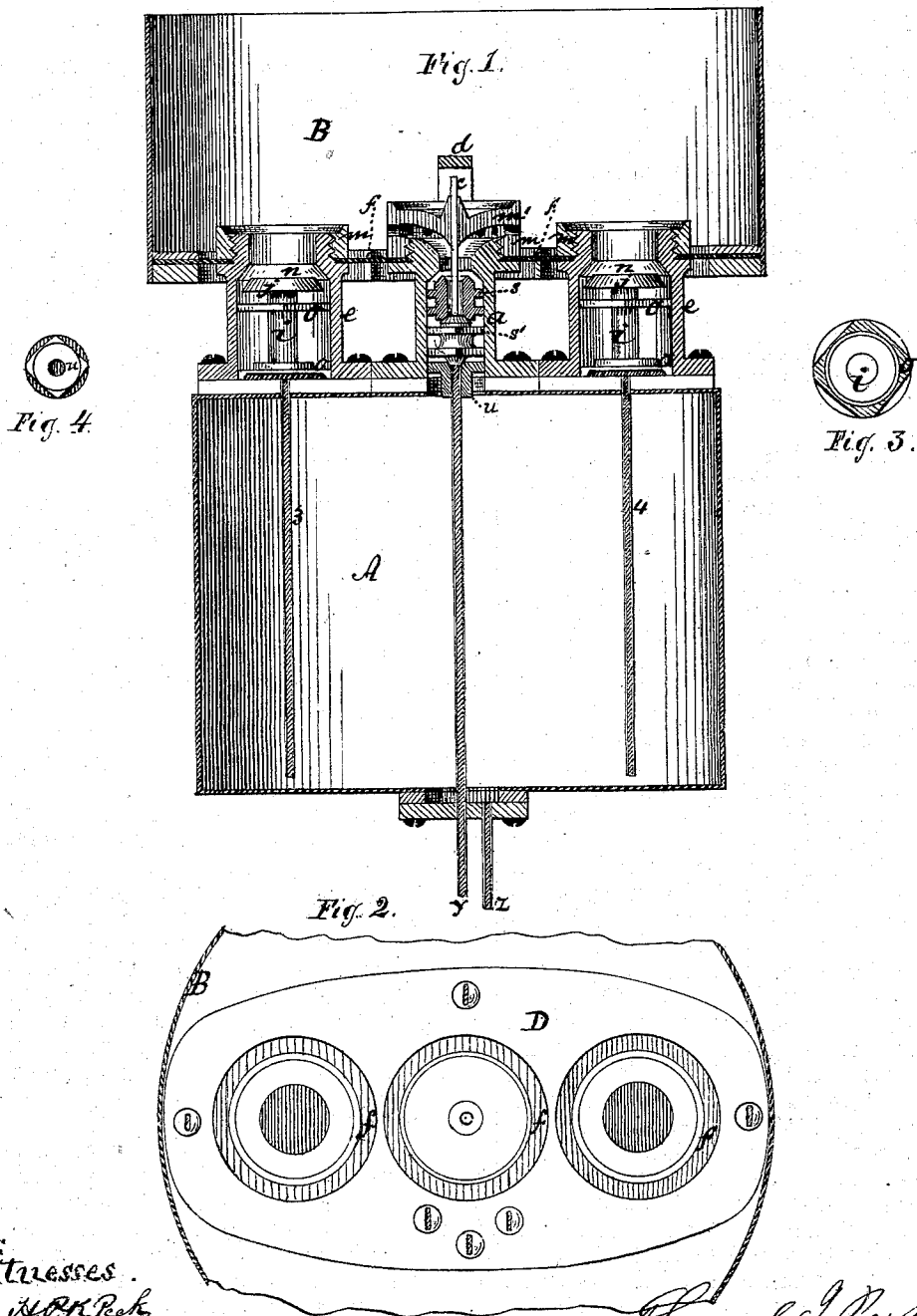


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Improvement in Steam-Boiler Feeders.

No. 127,362.

Patented May 28, 1872.



Witnesses.
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SAMUEL J. PARKER, OF ROCHESTER, NEW YORK.

IMPROVEMENT IN STEAM-BOILER FEEDERS.

Specification forming part of Letters Patent No. 127,362, dated May 28, 1872; antedated May 14, 1872.

To all whom it may concern:

Be it known that I, SAMUEL J. PARKER, of the city of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Boiler-Feeders; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon.

Figure 1 represents a central vertical section of my improved boiler-feeder. Fig. 2 represents a top view of a portion of the same. Figs. 3 and 4 represent valves and seats within their boxes.

My present invention relates to certain improvements upon the boiler-feeder for which a patent was granted to me April 12, A. D. 1870. One difficulty in that feeder is remedied by the use of a diffuser, employed to direct the discharge of the steam laterally into the water in the tank. This prevents "cutting out" the valve-check pin, and also prevents a constant vibratory action of the drum, which was produced in my former feeder by the reaction of the steam in entering the water of the tank. The "cutting out" or wearing away the pin referred to was produced by the action of the steam and water. The general structure and automatic mode of operation of my improved feeder for boilers are substantially the same as were described in my patent above named. The weighted lever to counterbalance the suspended drum, the flexible diaphragm connecting the tank with the valve-boxes, and the steam and water pipes communicating with a boiler, are all employed in my present application as they were used in my patented feeder.

The central valve-box *a* is provided with the two independent valves *s s'* and with the diffuser attached by its screw-cap *m*, through which the check-pin *c* is inserted. The pin *c* is of a proper size to closely fit the orifice in the diffuser but can move therein, as herein-after described. The two pipes *y z* will communicate with a steam-boiler by lateral connecting-pipes, to be attached at their lower ends. The pipes *y* and *z* are made fast with the bottom of the drum *A*, with which the pipe *z* directly communicates, and the pipe *y* has its upper termination in the valve-seat *u*, which stands in the lower part of the circular

orifice of the box *a*, but being of the square form indicated in Fig. 4 free communication is always maintained between the drum *A* and the valve-box *a* around the valves *s s'*. The solid valve *s'* is provided with two conical valves-faces, the lower one corresponding with the seat formed around the orifice, which terminates above the upper end of the pipe *y*, and the upper one corresponding with the seat formed at the lower end of the hollow valve *s*. The check-pin *c*, which serves to hold the solid valve *s'* upon its seat when the drum *A* is raised by a lever and weight, will come in contact at its upper end with the bridge *d*, and thus hold the valve *s'* down upon the seat *u*, through which seat the steam from the boiler enters. The two pipes 3 and 4, for discharging water from tank *B* to drum *A*, are fastened at their upper ends to the head of the drum *A* and communicate with valve-boxes *e e*, also fastened like box *a* upon the head of the drum. In these boxes *e e* check-valves *i i* are placed, with their conical faces *j* at their upper ends made to fit against the correspondingly-formed seats *n n*, around orifices communicating with the tank *B*. The valves *i i*, like the valves *s s'*, are provided with wings or flanges *o o*, which serve to keep them upright, and leave four orifices at their upper sides to permit the water to pass by them within their cylindrical boxes *e e*. These three circular openings in the bottom of the tank *B* and in the plate *D* (between which the elastic diaphragm *f* is secured) are larger than boxes *a e e*, which are also connected at their necks with the diaphragm *f* by screw-collars *m*. These large openings and the elastic diaphragm *f* permit the drum *A* and boxes *a e e* with the pipes 3 4 *y z* to be vibrated up and down to operate the valves and admit the passage of steam and water and to close the passages, as hereinafter explained.

When the drum *A* is in the position represented in Fig. 1 it would be nearly filled with water, and the counter-balance weight (as used in my patented feeder) would be elevated, and the steam from the boiler would enter through the pipe *y* and force up the valves *s' s* and close the aperture at the neck of box *a*, and the steam would enter the drum *A*, and also acting upon the body of water in the drum *A* force up the valves *i i* and close the ingress

of water from the tank B. But when the water in drum A has mostly escaped into the boiler through the pipe *z* (the boiler being thus always filled to the level, where the lateral steam-pipe communicates with it) the weighted lever will raise up the drum A, deflecting diaphragm *f* upward until the check-pin *c* strikes the bridge *d* and thereby holds the valve *s'* upon the seat *u*, completely closing off the steam which was entering from the boiler. The expansive power of the steam will still act upon valve *s*, (in escaping from the drum A) and detach it from the seat of the valve *s'*, and thereby permit the steam in the drum A to pass around the seat *u* and valve *s'*, and through valve *s*, and thence through the diffuser *m'*, formed in the cap of the central screw-collar *m*, diffusing itself in the water of tank B; and when the pressure of steam in the drum A is sufficiently reduced the check-valves *i i* will fall from their seats *n* and permit the water from the tank B to refill the drum A, and, at the same time, valve *s* will drop down upon valve *s'*, which will open an enlarged space around it for the spent steam to escape more freely as the water fills up the drum. When the drum is nearly filled again it will descend by its gravity and elevate at the same time the weighted lever. These operations will be continually repeated automatically and keep a constant fixed supply of water in the boiler.

It will be understood that the pipes 3 and 4 must extend to nearly the bottom of the drum A, otherwise the spent steam would pass off through the boxes *e e* and prevent the free ingress of water from the tank; but, as the lower ends of these pipes, 3 and 4, are always submerged in water, the steam will be forced to escape through the box *a* and the diffuser.

The necessity of valve *s* arises from the fact that, if the upper seat of valve *s'* were enlarged so as to close the aperture at the neck of box *a*, the action of the steam upon

so large an area would prevent the automatic action of the drum and its weighted lever; and the enlarged opening at the neck of box *a* is necessary to permit the steam to escape from the drum with the required speed to allow the water to quickly fill the drum A through pipes 3 and 4.

Instead of using the two check-valves *i i* and pipes 3 4 to conduct the water from tank B to the drum A, a flexible tube with a check-valve would serve the same purpose if attached to these two vessels on their outsides; but in that arrangement the flexible tube would be required to enter the drum as low down as the end of the pipes 3 and 4, so as to be always submerged to prevent steam from escaping through it while the drum is filling with water.

Having described my invention, what I claim as an improvement upon my boiler-feeder patented April 12, 1870, is—

1. The combination of the diffuser *m'* with the valve-box *a*, as arranged within the water-tank B, substantially as and for the purpose specified.

2. The double-faced solid valve *s'* in combination with the seat *u*, tubular valve *s*, and check-pin *c*, substantially as and for the purpose specified.

3. The combination of diffuser *m'*, having lateral openings, with pin *c*, valves *s s'*, box *a*, and seat *u*, substantially as and for the purpose specified.

4. The central box *a* with its appendages for transmitting the steam from the drum A to tank B, in combination with one or more boxes *e e* with its appendages for conducting water from tank B to drum A, operating automatically, substantially as and for the purpose described.

In testimony hereof I have hereunto set my hand this 23d day of September, 1871.

SAMUEL J. PARKER.

Witnesses:

H. P. K. PECK,
A. C. PARSONS.