(No Model.)

# F. S. ANDERSON & C. SAUER.

## FEED WATER APPARATUS.

No. 262,721. Patented Aug. 15, 1882.

*Fig. 1.*

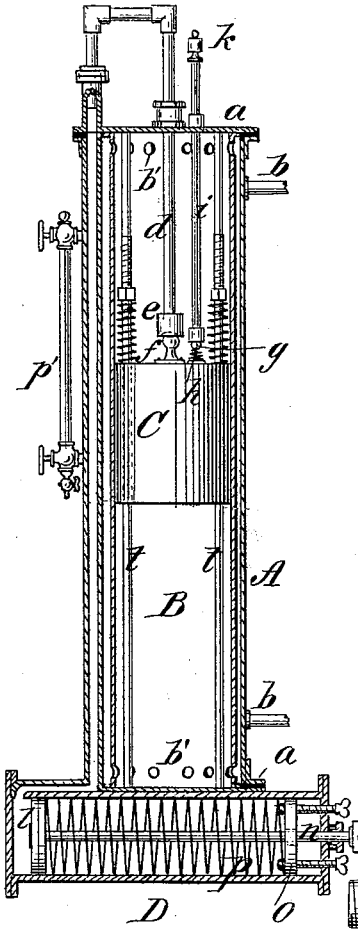
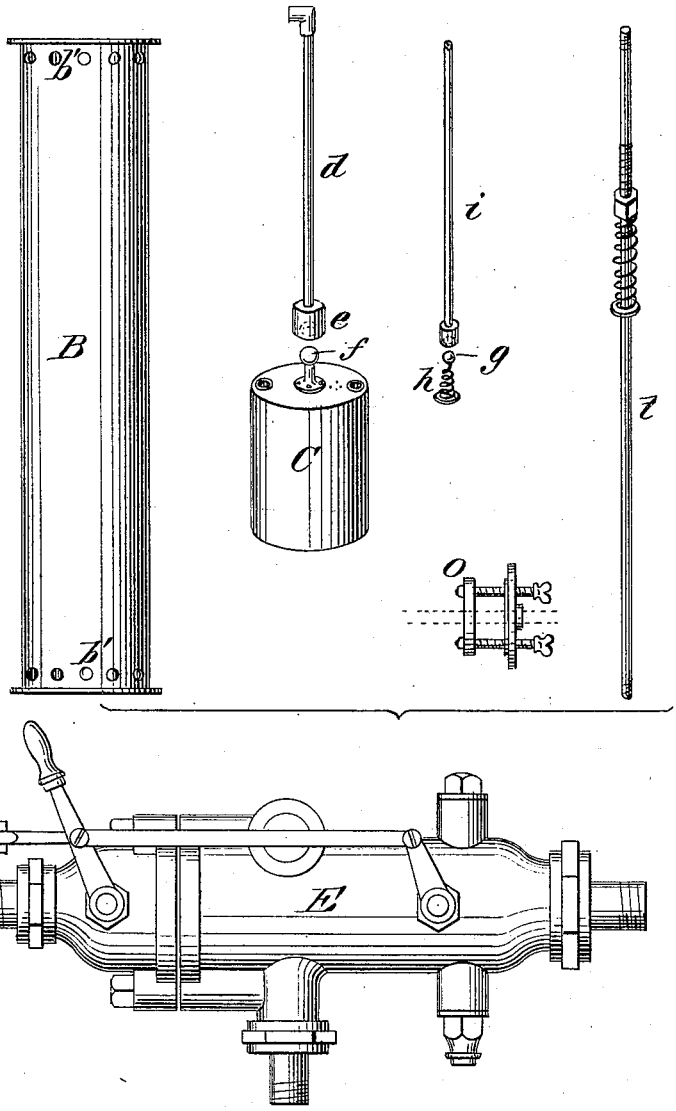



*Fig. 2.*

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# UNITED STATES PATENT OFFICE.

FRANK S. ANDERSON AND CHARLES SAUER, OF EASTON, MARYLAND.

## FEED-WATER APPARATUS.

SPECIFICATION forming part of Letters Patent No. 262,721, dated August 15, 1882.

Application filed April 14, 1882. (No model.)

*To all whom it may concern:*

Be it known that we, FRANK S. ANDERSON and CHARLES SAUER, of Easton, in the county of Talbot and State of Maryland, have invented a new and Improved Feed-Water Apparatus and Alarm for Boilers, of which the following is a full, clear, and exact description.

The object of our invention is to furnish a reliable feed-water governor for boilers, and one that shall also give alarm when the water falls below the safety-line.

The invention consists in a combination of cylinders and a float, as hereinafter described and claimed.

Reference being had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in both the figures, Figure 1 is a sectional elevation of the feed-water governor and alarm, and Fig. 2 shows the parts separately.

A is a hollow cylinder of metal, provided with steam-tight heads *a a*, and fitted with water and steam pipes *b b* at top and bottom, by which it is to be attached to the boiler.

B is a second hollow cylinder, contained in the cylinder A, and somewhat smaller, so as to give space between the two. This inner cylinder is held by the caps *a a*, and is provided at its end with perforations *b' b'*, that allow free passage of steam and water.

C is a float fitting snugly in cylinder B, so as to rise and fall with the water-level.

*t t* are vertical guides on which the float moves. The guides *t* are used to insure fit of the two ball-valves, and are provided with spiral springs to preserve the float from any sudden jar or movement that might cause it to rise or to fall, and thus open the steamways when not desired. These springs can be tightened or loosened, as required, by the nuts on the guides, as shown.

*d* is a steam-pipe extending from the upper part of cylinder B through the upper head, *a*, and formed at its lower end with a seat, *e*, for a ball-valve, *f*, that is attached on the upper end of the float.

*g* is a second and smaller ball-valve, attached on the float by means of a spiral spring, *h*, and *i* is a steam-pipe formed at its lower end with a seat for the valve *g*, and extending through the upper head, *a*, where it is provided with a whistle, *k*.

D is a cylinder attached to the lower end of the cylinder *a*, and fitted with a piston, *l*, and a rod, *n*, that is connected for stopping and starting the feed pump or injector.

*p* is a spiral spring in the cylinder D, around rod *n*, for returning the piston. *o* is an adjustable head for tightening and loosening the spring *p*.

E is an injector of any suitable construction.

*p'* is a glass gage fitted on the side of the cylinder A for indicating the height of water.

In operation, when the water in the boiler is at the highest point of safety, the valve *f* is upon the seat at the lower end of the pipe *d*, and steam is thus cut off from the cylinder D. As soon as the water-level falls steam passes to the cylinder D, and by pressure on the piston *l* operates the rod *n* and sets the injector in operation. Water being thus forced into the boiler, the level is raised and the float rises. At the same time the valve *f* moves to its seat and cuts off the steam. The valve *g* of the whistle-pipe will not leave its seat until the float has fallen far enough to allow full expansion of the spring *h*, thereby preventing an alarm when the feed-water apparatus is in order; but in case the injector should fail to work, and the water-level be thereby brought down below safety-point, the whistle-valve will leave its seat and the whistle will be blown.

This apparatus, it will be seen, is entirely automatic in its operation. It may be used in connection with any form of boiler, and will keep the water at nearly one point at all times, never allowing the level to low-water mark except when the feed-water apparatus is out of order, when the alarm will be sounded. This will insure a saving of fuel, as a steady fire can be maintained at all times and under all circumstances. It is especially useful with agricultural and plantation engines, for which expert engineers are not usually employed.

The inner cylinder, B, is used to still or quiet the water and prevent unsteadiness of the float.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The feed-water governor consisting of cylinders A and B, float C, valve *f*, and steam-

pipe *d*, substantially as described, combined for operation as set forth.

2. The feed-water governor and alarm consisting of cylinders A and B, float C, provided with valve *g*, and steam-pipe *i* of the whistle *k*, substantially as described, combined for operation as set forth.

3. The combination, in feed-water apparatus, of cylinders A and B and float C, whistle *k*, and steam-pipes *d i*, substantially as shown and described.

4. In feed-water apparatus, the inner cylinder, B, fitted with float C, combined with the outer cylinder, A, substantially as shown and described.

5. In feed-water apparatus, the cylinder D, provided with spring-cushioned piston *l* and rod *n*, connected for stopping and starting feed-water-feeding devices, combined with the cylinder A and the inner apertured cylinder, B, containing a float that rises and falls with the water-level in the boiler, substantially as described.

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Witnesses:
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