

(No Model.)

N. L. ADAMS.
Low Water Alarm for Boilers.

No. 230,213.

Patented July 20, 1880.

Fig. 1

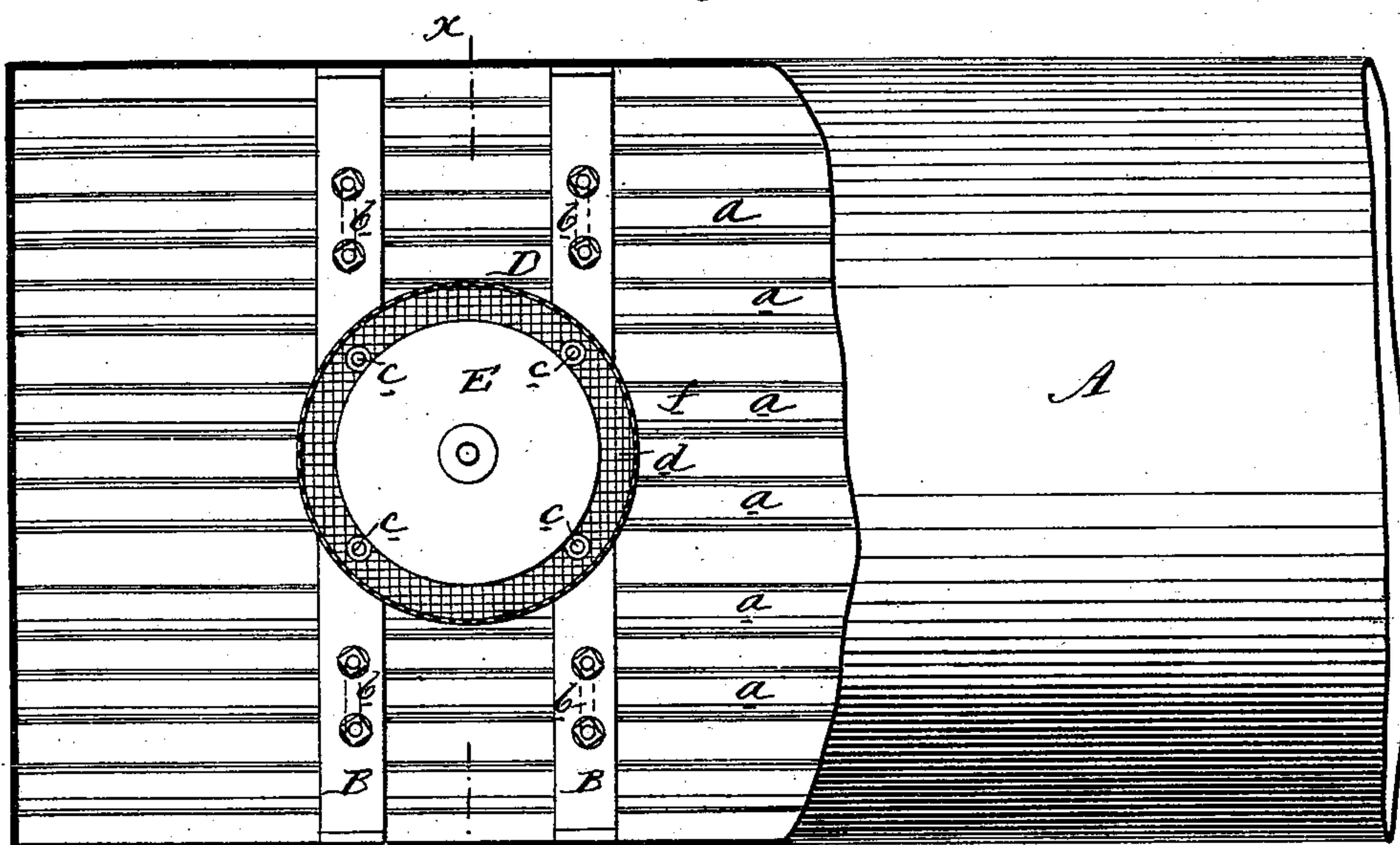


Fig. 4

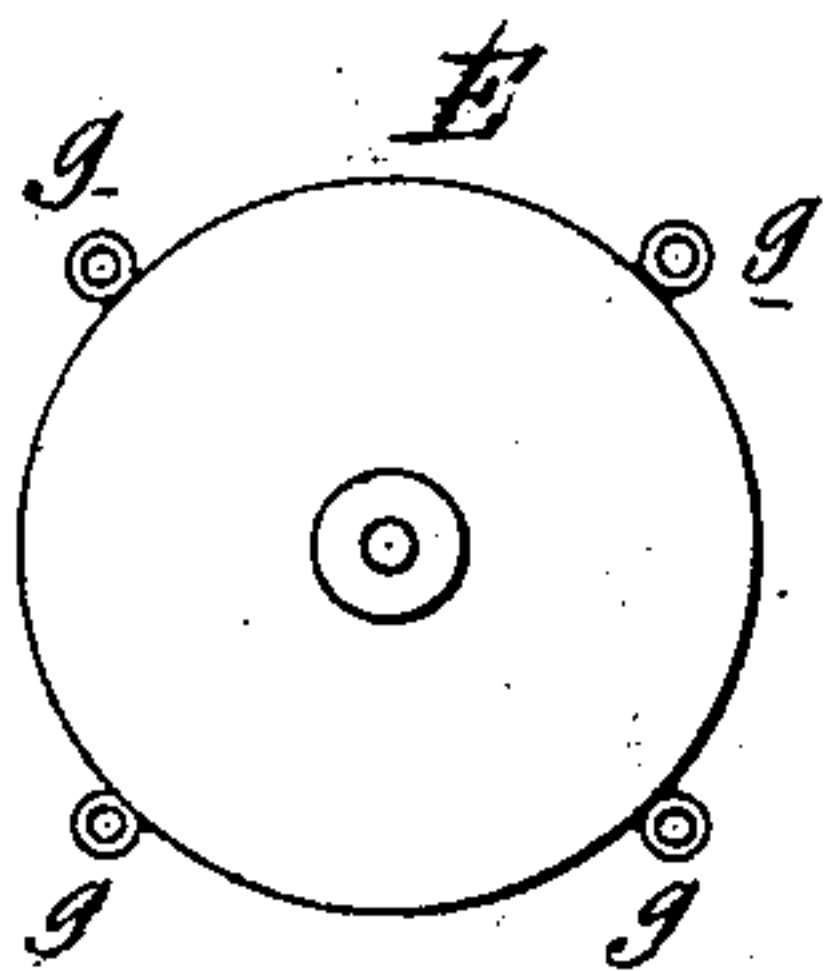


Fig. 2

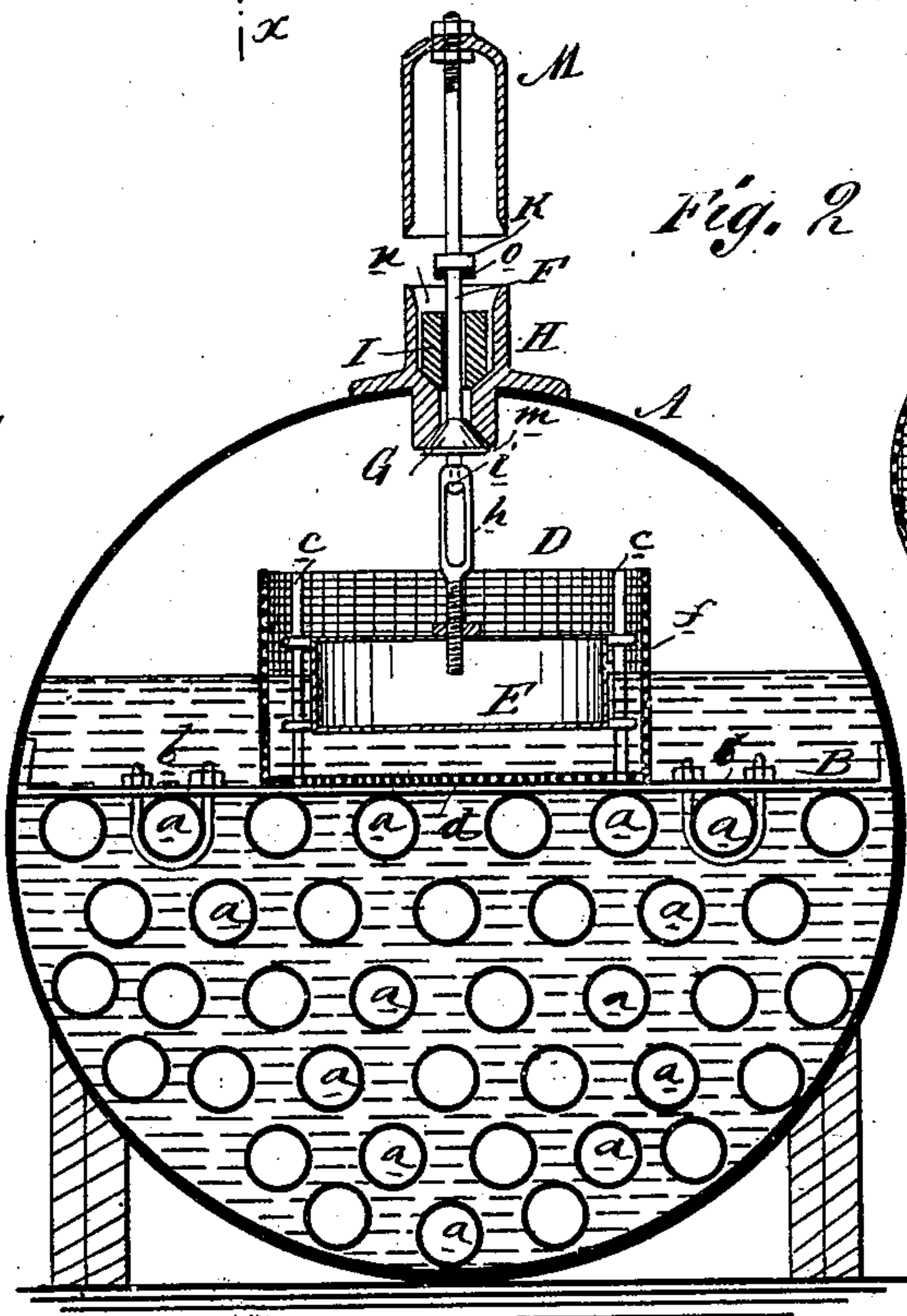
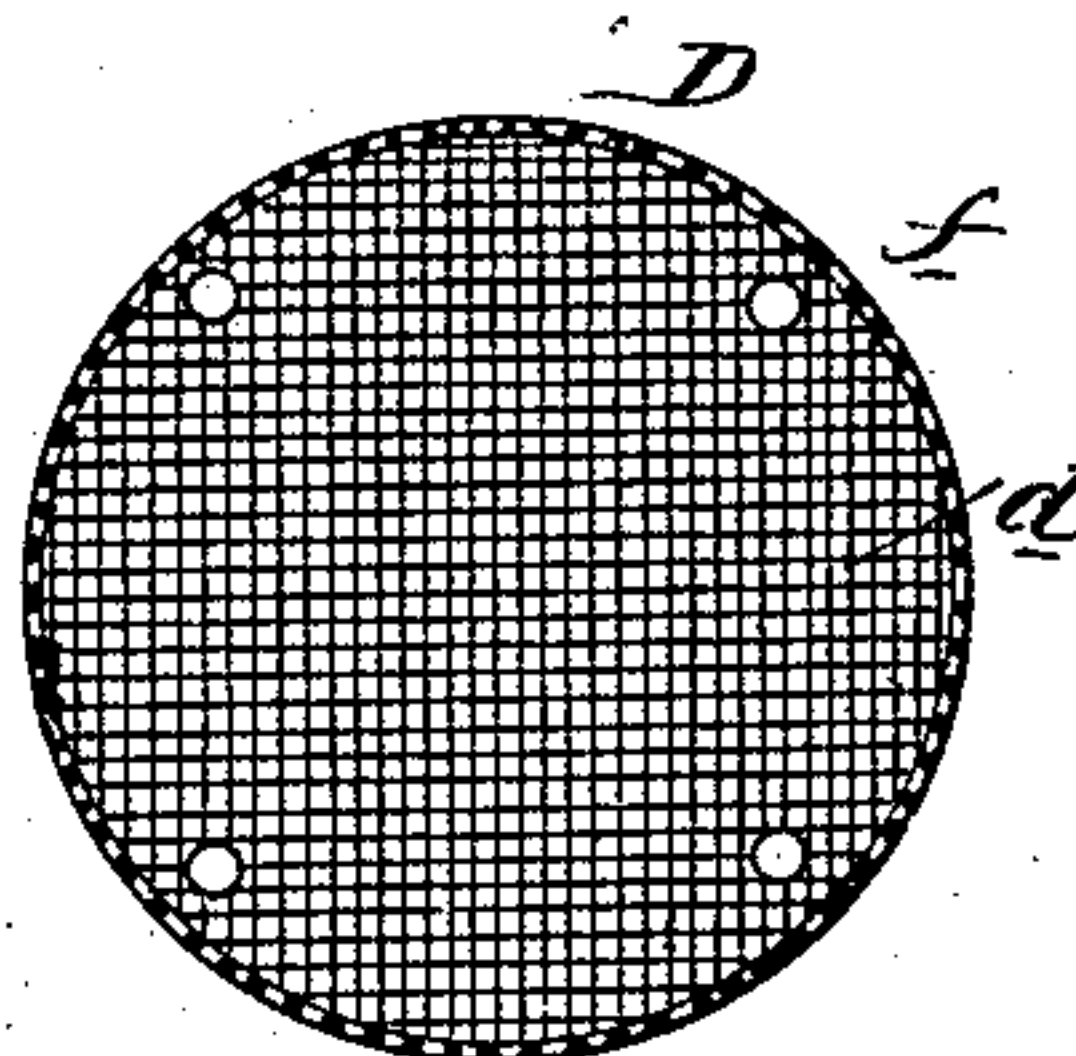


Fig. 3



WITNESSES:

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UNITED STATES PATENT OFFICE.

NATHAN L. ADAMS, OF FORT COLLINS, COLORADO.

LOW-WATER ALARM FOR BOILERS.

SPECIFICATION forming part of Letters Patent No. 230,213, dated July 20, 1880.

Application filed May 19, 1880. (No model.)

To all whom it may concern:

Be it known that I, NATHAN L. ADAMS, of Fort Collins, in the county of Larimer and State of Colorado, have invented a new and Improved Low-Water Alarm for Boilers, of which the following is a specification.

The object of this invention is to furnish steam-boilers with an improved device that will indicate automatically and give an alarm when the water in the boiler falls below the safety-point.

Figure 1 represents a plan of a section of a boiler, with a portion broken away to exhibit parts of the device in position. Fig. 2 is a transverse sectional elevation on line *xx*, Fig. 1. Fig. 3 is a plan of the perforated box or case inclosing the float. Fig. 4 is a plan of the float.

Similar letters of reference indicate corresponding parts.

In the drawings, A represents a boiler provided with series of flues *a a*, transversely across which the plates or bars B B are secured by screw-clasps or staples and nuts *b b*, or other convenient device, the ends of said bars B B being turned up against the inside of the boiler, as shown, thereby strengthening the same.

Four equidistant pins or standards, *c c*, project directly up from the bars B B, and on and over these said standards or pins *c c* is placed and fitted a circular perforated plate, *d*, that rests on the bars B B, and is fastened thereto with sufficient firmness to resist the buoyant action of the water within the boiler. This plate *d* extends an inch, or thereabout, outside of the standards *c c*, and set around and attached to the circumference of this plate *d* is the perforated ring *f*, the parts *d f* thereby forming the box or case D, in which the float E moves, said perforated box or case D being designed to freely admit water to the float E, while at the same time preventing the said float E from being disturbed by the ebullition of the water.

The float E is cylindrical and hollow, and from its top and bottom plates project laterally the perforated lugs *g g*, that fit over and upon the standards *c c* to guide said float E, that it may easily and smoothly move up and down. The linked end *h* of the valve-stem F

is screwed centrally into the top of the float E, while the upper part of said stem F is swiveled in the top of the said looped end, as shown at *i*, so that said upper part may at any time be turned around to rub the lower valve, G, in and against its seat to remove any scale or deposit thereon that might interfere with the close fitting of said valve in its seat, said valve-stem F being passed up through the block H.

The lower valve, G, is immovably fixed upon the valve-stem F, and is held by the buoyancy of the float E firmly up against the valve-seat *m* when the water in the boiler A is at proper level, so that no steam can escape through said valve-seat *m*.

H is a hollow and chambered block of metal fixed in an opening made in the top of the boiler A, so that it extends partly within and partly above said boiler. In the lower end of said block H a conical valve-seat, *m*, is formed for the reception of the conical valve G, while in its upper end is formed a chamber, *n*, for the reception of the valve I, that is fitted loosely about the valve-stem F.

K represents a nut, and *o* an elastic washer beneath it, the two forming a stop fixed on the valve-stem G above the valve I, and N represents the steam-whistle set on top of the valve-stem G.

So long as there is sufficient water in the boiler A the float E is held up by the said water, so that the valve G is pressed closely in its seat *m*; but when the water in the boiler has fallen below the safety-point—to the flues *a a*, or thereabout—the float E falls, so as to withdraw said valve G from its seat *m* and permit the escape of steam through the block H, and the escaping steam, then impinging upon the loose valve I, forces said valve up partly out of the block H on the valve-stem F against the stop consisting of nut and washer K *o*, which washer *o* closes the bore of said valve steam-tight, and the valve being lifted and held by the force of the steam partly out of its seat, the steam escaping from the boiler is forced, under pressure, out through the annular space around and between said valve I and the sides of the chamber *n* and upon the whistle N, that is fixed on top of the valve-stem F, and thereby sounds the alarm.

The float E will ordinarily be set about half

an inch above the perforated bottom plate, *d*, so that said float shall fall and cause the alarm to be given when the water is about two inches deep over the boiler-flues.

5 The float and the valves are so designed and adjusted that a vertical movement of one-quarter of an inch, or thereabout, is sufficient to operate them to sound or stop the alarm.

10 Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

15 1. A low-water alarm for boilers containing the following elements, namely: a float, *E*, provided with a linked and swiveled stem, *F*, carrying a fixed valve, *G*, a loose sliding valve, *I*, and a whistle, *N*, substantially as herein shown and described.

2. In a low-water alarm for boilers, the combination, with the float *E*, of the bars *B B* and standards *c c*, substantially as herein shown and described, whereby said float is guided, as set forth.

3. In a low-water alarm for boilers, the combination, with the valve-stem *F*, of the sliding valve-stop *K o*, substantially as herein shown and described, whereby said sliding valve is stopped and made steam-tight, as set forth.

NATHAN L. ADAMS.

Witnesses:

H. B. HOUSTON,
DAVID PATTON.