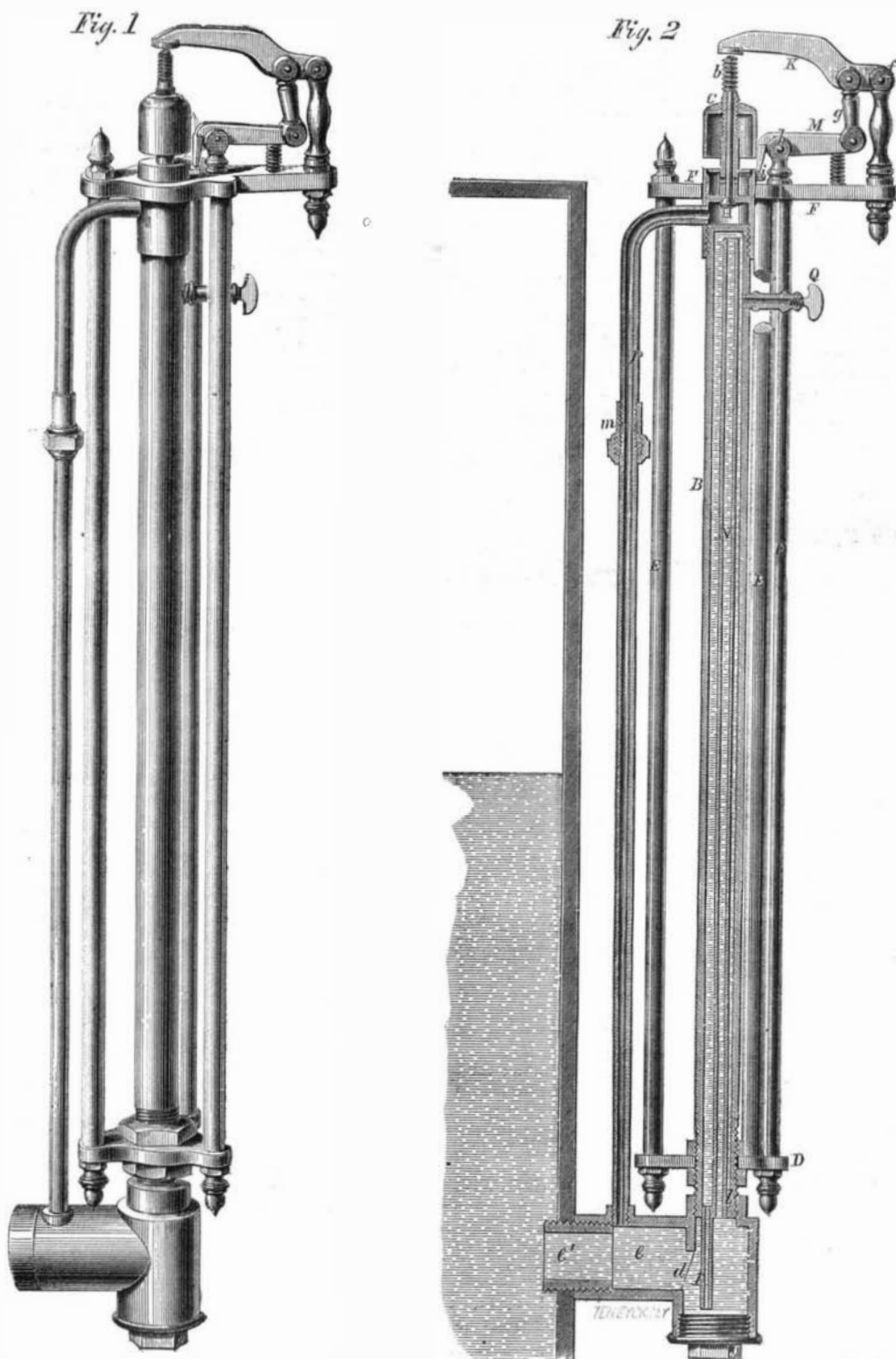


**A Low Water Detector.**

It is well known that more boiler explosions occur in consequence of the water getting too low in the boiler than from any other cause; perhaps more than from all other causes combined. Many plans have been devised for giving notice to the engineer when the water is getting too low, and among them is the plan of the expanding tube. This consists in connecting a long tube with the boiler in such manner that the tube may be filled with water when the water in the boiler is at its proper level, but when the water falls steam will enter the tube, and by its greater heat will cause the tube to expand. Suitable mechanism is arranged so that the expansion of the tube will admit steam to the whistle, and thus sound the alarm. The accompanying engravings represent some modifications in his plan, and they are excellent illustrations of this class of low water detectors.

Fig. 1 is a perspective view of the apparatus, and Fig. 2 is a vertical section. B is the expanding tube, communicating at its lower end with the water in the boiler, through the pipe, *e'*, which is inserted in the head of the boiler at the level at which it is desired, to sound the alarm. The tube, B, has in its axis a smaller tube, N, open at both ends, and a tube, I, also open at both ends, is inserted in the lower end of tube, B; the tubes thus forming a syphon. When the steam begins to form in the boiler, the first time after the detector is applied, the stop cock, Q, is opened to permit the escape of air, and the pressure of steam forces the water into the tube, B, filling it, when the stop cock, Q, is closed. As long as the water in the boiler remains above the level of the pipe, *e'*, the tube, B, will continue full of water, and as it is at a little distance from the boiler it will be comparatively cool. But if the water in the boiler falls to the level of the opening, *d*, from the pipe, *e'*, to the tube, the water will flow down by gravity into the boiler, and steam will flow into the tube, causing it to expand by the increase in temperature.



**BLAKE'S LOW WATER DETECTOR.**

The mode in which this expansion is made to sound the whistle is as follows: A steam pipe, P, leads from the chamber, *e*, to the steam whistle, C, the passage to the whistle being closed by the puppet valve, H, which is held up in place by a spiral spring, *b*. A lever, K, having its fulcrum at *f*, is connected by a link, *g*, with a second lever, M, which has its fulcrum at *h*, and the end of its short arm resting over a projection on the tube, B. It will be seen that the levers,

being actuated near their fulcrum, a small motion of the projection on the tube, B, will cause a large motion of the end of lever, K, which will press down the valve, H, and admit steam to the whistle, C, thus sounding the alarm.

The levers, K and M, are attached to a plate, F, which is connected by rods E E, with the plate, D, at the lower end of the tube.

The plug, J, is provided for cleaning the pipe, whenever it may be necessary.

The pipe, M, has an expansion joint, *m*, so that it may not be injured by the changes of temperature.

The opening into the pipe, P, being a little above the opening, *d*, into the tube, B, the steam will continue to blow the whistle after the water begins to fill the tube, B, and thus the blowing of water through the whistle is prevented.

The arrangement of the tubes so as to form a syphon causes a constant circulation through them, and thus prevents any accumulation of sediment, or any formation of scale upon their surfaces. This important advantage has been proved by eighteen months' practical trial. This arrangement also causes the tubes to be emptied very quickly on the reduction of the level of the water in the boiler; thus making the apparatus exceedingly sensitive and prompt in its action.

This detector was invented by George W. Blake; the patent was granted August 20, 1861, through the Scientific American Patent Agency, and further information may be obtained by addressing Blake & Wheelock, at No. 71 Gold street, New York city.

**TREATMENT OF EARACHE.**—M. Emile Duval, of Lyons, France, says that he has, in person, found relief in severe earache, after other means had been tried in vain, from the use of a mixture of equal parts of chloroform and laudanum; a little being introduced on a piece of cotton. The first effect produced is a sensation of cold; then there is numbness, followed by a scarcely perceptible pain and refreshing sleep.