C. W. Copeland.

Stop Cock.

No. 6,913. Patented Nov. 27, 1849.

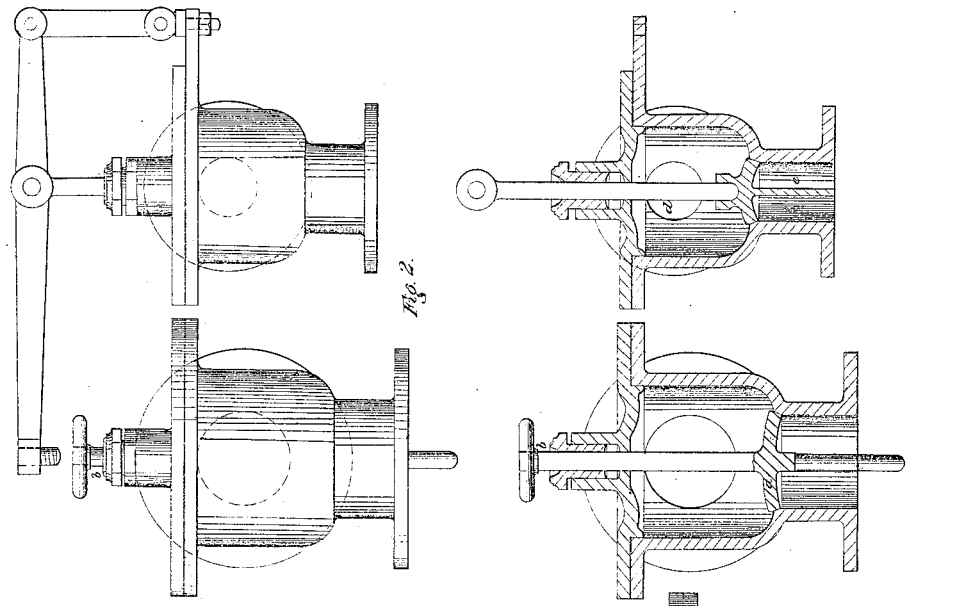

Fig. 2.

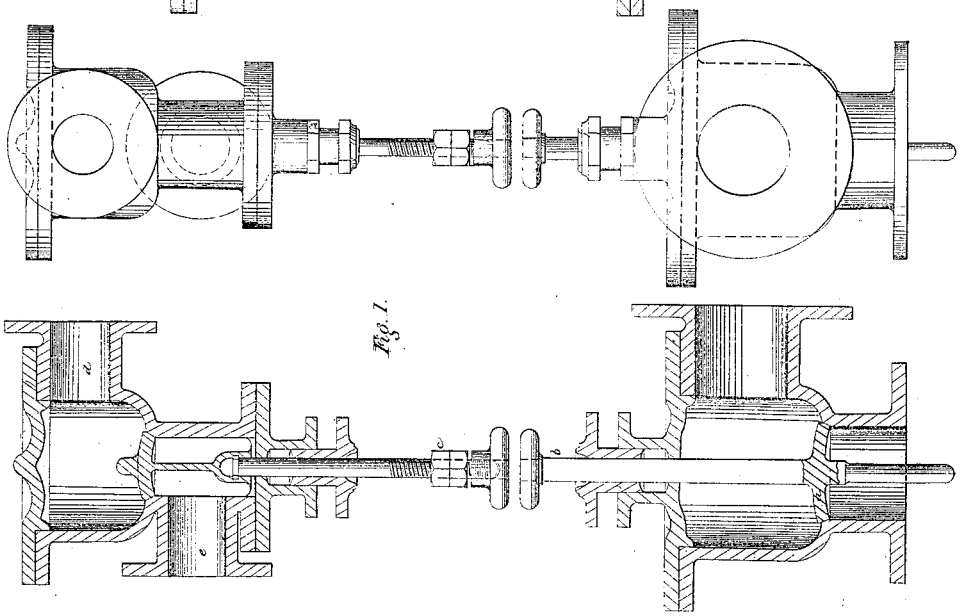

Fig. 1.

UNITED STATES PATENT OFFICE.

CHARLES W. COPELAND, OF BROOKLYN, NEW YORK.

METHOD OF REGULATING THE BLOW-OFF VALVE OF STEAM-BOILERS.

Specification of Letters Patent No. 6,913, dated November 27, 1849.

To all whom it may concern:

Be it known that I, CHAS. W. COPELAND, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Steam Engines and Boilers; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a view in section of one method of construction. Fig. 2 is a view in section of another method of construction.

Similar letters refer to similar parts in both figures.

My invention consists in improvements in the methods of discharging that portion of the water from the boilers of steam engines, known as the "blow off" water. This is an operation which is required to be done only in cases where the water used for the generation of steam contains a considerable amount of foreign matter as in all cases the steam produced from such water leaves the boilers freed from the impurities it contained, the consequence is a gradual accumulation of this foreign matter in the boilers which would be greatly to its injury were no means used to remove it. This is accordingly accomplished by an operation technically called "blowing off" that is causing a certain amount of the water to be discharged from the boilers, at certain regular intervals. The water at these periods of discharge being loaded with these foreign substances carries a certain proportion of it from the boiler thereby clearing it sufficiently to prevent any injurious deposit or accumulation. A fresh amount of the less dense feed water being constantly pumped in, to supply both the quantity required for steam and that which has been "blown off."

Much waste of fuel, destruction of the moilers and risk of explosion can ensue from not regulating this "blow off" according to the nature of the case requiring it. The most common mode of doing this is to open a cock by hand at certain intervals and thus effect the object, but this is liable to risk from carelessness and neglect of the attenddants. Danger may also arise from want of skill or judgment in the operation accordingly some attempts have been made to effect this operation by the action of the engine so that it shall regulate and cause the periodical discharges or "blow off" but all such contrivances have been defective in this respect viz, that there was no regard paid to the varying quantity of the feed water or in case of stopping the feed altogether designedly or by accident, the "blow off" still continued, unless the parts which caused it were disconnected from the engine. My invention although of the self operating kind differs essentially in this respect, viz, that the feed and "blow off" must always operate in unison, because I effect the "blow off" wholly by the action of the feed water itself, so that when that ceases to enter the boilers, the blow off also ceases, the operation being such that at every stroke of the feed pumps a certain amount of water is discharged from the boiler to effect the "blow off." This I accomplish by causing a connection to be formed between the stem of the ordinary "check valve," which is put on all boilers, so that at every rise of the said valve by the injection of water into the boiler it is made to act upon the stem of an outlet or "blow off" valve communicating with the same boiler, so that said valve is opened sufficiently to allow of the escape of the "blow off" water.

In Fig. 1 a side view is given of a boiler thus arranged the letter (*a*) represents the ordinary "check valve," (*b*) is the stem of the same rising up through the stuffing box in the cover. Immediately over this I affix a delivery valve in such a manner that its stem shall terminate near the stem of (*b*) as represented. A regulating screw cap (*c*) is attached to this stem, in order to regulate the opening of the "blow off" valve. (*d*) is a pipe leading from the "blow off" valve to some spot inside the boiler from which it is best to take the "blow off" water. (*e*) is the discharge pipe.

The operation is effected by the rising of the stem (*b*) which is forced up by the action of the feed pump in injecting the feed water through the valve into the boiler. The cap (*c*) must be screwed down so as to be struck by (*b*) in its ascent, thus causing it to open the delivery valve and effect the "blow off." By means of the regulating cap (*c*) the quantity of water blown off may be increased or diminished as the case may require.

In Fig. 2 a modification of my apparatus is exhibited. The difference consists simply in changing the positions of the delivery valve with respect to the check valve, so

that instead of being acted upon directly by the stem of the check valve, it operates through the medium of a lever. The arrangement being apparent from a view of the drawings.

What I claim as of my own invention and improvement and desire to secure by Letters Patent is—

Regulating the "blow-off" water by the action of the "feed" water to that said "blow-off" water will always bear a certain proportion to the quantity fed which ratio must vary according to circumstances, and so as to cease entirely when the "feed" ceases to enter the boiler. Secondly—I claim the combination of the "blow-off" valve with the check valve in such manner that the "blow off" valve will be operated by the stem of the check valve the whole being arranged and constructed.

Substantially in the manner and for the purpose set forth herein.

CHAS. W. COPELAND.

Witnesses:

S. H. MAYNARD,

ED. B. UNDERHILL.