G. H. CROSBY.

Safety-Valves.

No. 150,536. Patented May 5, 1874.

Fig. 1.

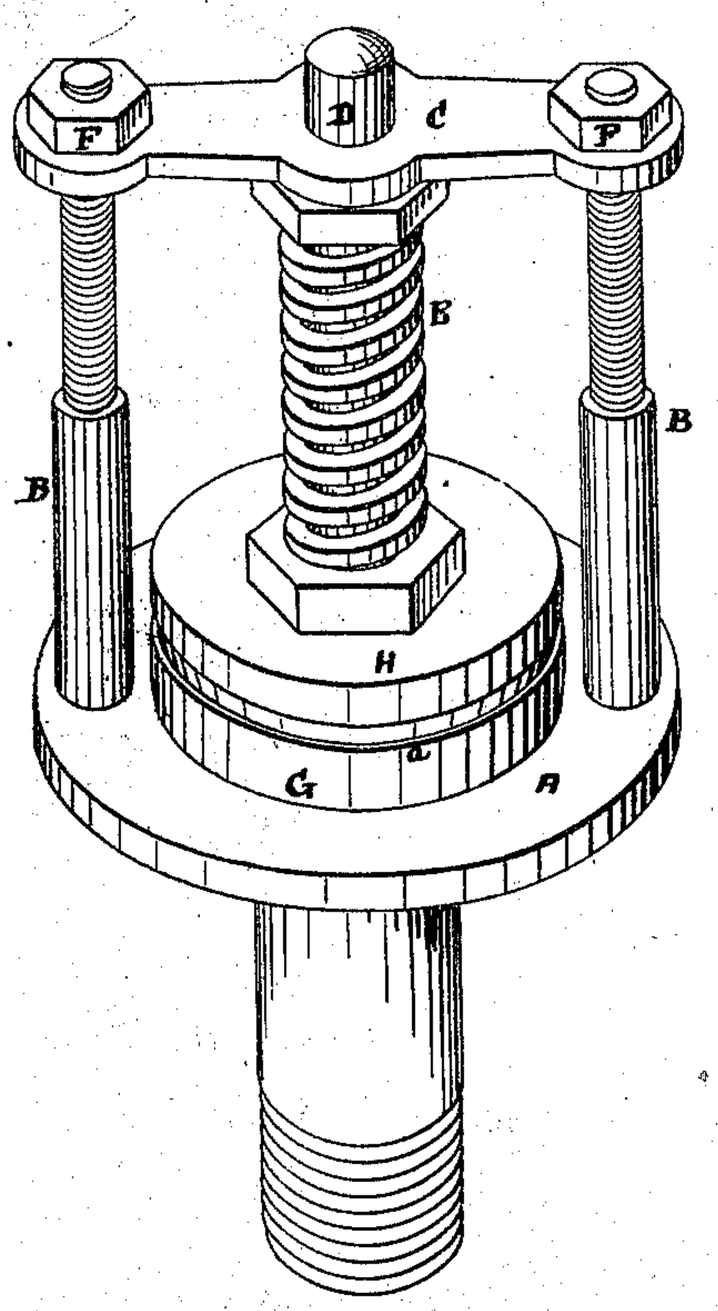
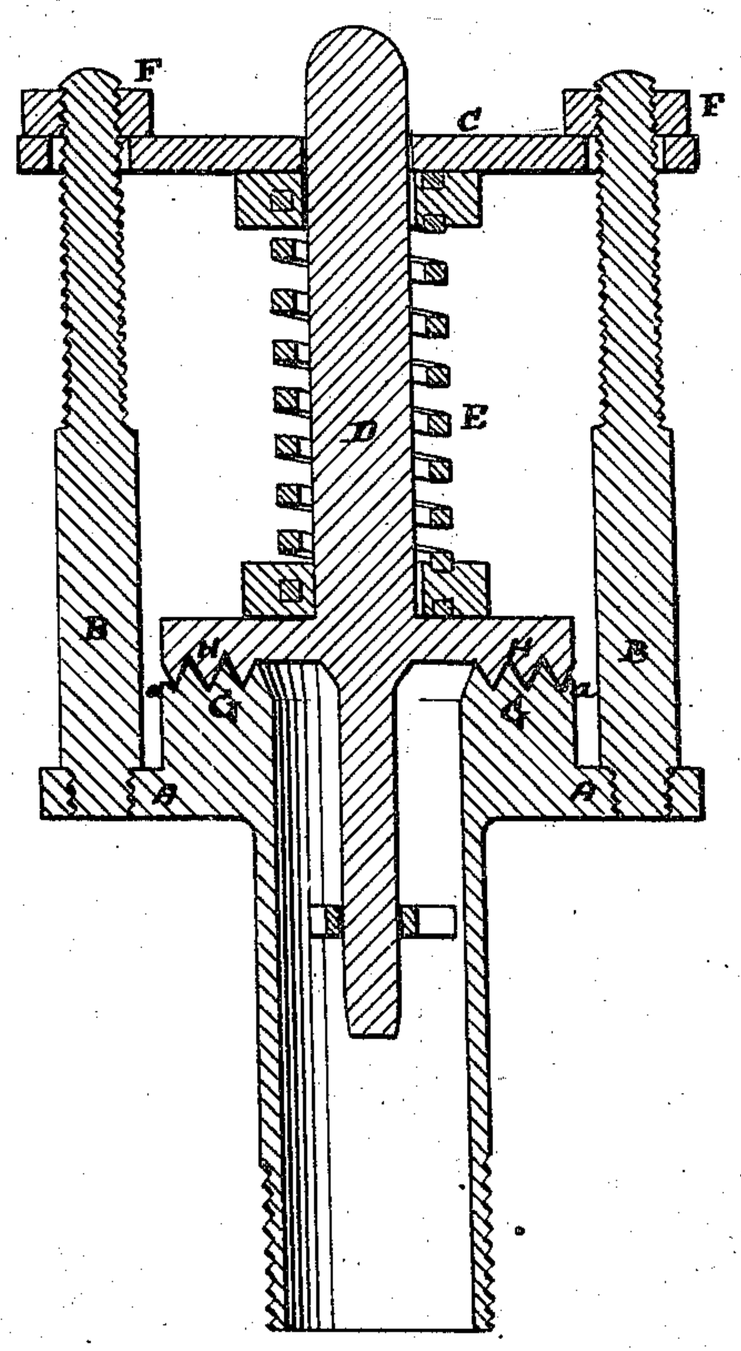


Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE H. CROSBY, OF EAST SOMERVILLE, MASSACHUSETTS.

IMPROVEMENT IN SAFETY-VALVES.

Specification forming part of Letters Patent No. **150,536**, dated May 5, 1874; application filed March 20, 1874.

To all whom it may concern:

Be it known that I, GEORGE H. CROSBY, of East Somerville, Middlesex county, Massachusetts, have invented certain new and useful Improvements in Safety-Valves, of which the following is a specification:

My invention consists in a corrugated face or bearing for a safety-valve, and the corresponding corrugated seat for the same, the whole so arranged that the face and seat shall match and make one continuous bearing capable of being ground together, and forming a tight joint.

The objects I have in view are, first, to have the valve open at the desired maximum pressure, and to remain open until the pressure has been reduced to the minimum desired, and then to close; second, to have the valve to open at the desired maximum pressure, and to be so operated that should steam be generated ever so fast the valve will open wide enough to relieve the boiler of all pressure in excess of the maximum desired.

These results are accomplished, first, by having the outside diameter of the bearing considerably in excess of the inside diameter, and the bearing corrugated, thus giving a larger area for the steam to act on after the valve is open than when it was closed, and consequently tending to raise the valve higher; second, when the valve is open the zigzag or crooked passage through which the steam has to escape compels the steam to constantly change its motion, impinging at every angle or turn, and consequently creating a lifting power in addition to the direct pressure of steam in the boiler; third, the steam in its escape through this crooked opening or sinuous path when the valve is raised forms a cushion or impediment to be overcome before the valve can close.

The nature of my invention, and the manner in which the same is or may be carried into effect, will be readily understood by reference to the accompanying drawing, in which—

Figure 1 is a perspective view of a safety-valve made in accordance with my invention. Fig. 2 is a longitudinal vertical central section of the same.

The safety-valve shown in illustration of my invention is, in its general organization, one of the old and well-known forms of safety-valve.

To the bed A of the valve-seat are affixed the upright guide-rods B, screw-threaded, as shown. On them fits loosely the presser-bar C, which, at its center, is perforated for the passage of the valve-stem D. The bar rests on the upper bearing block or ring of the spring E, which, at its lower end, has another corresponding bearing-ring resting on the valve. The rods B are provided with nuts F, by which the pressure of the bar on the spring is regulated. These parts are all of the usual construction, and operate together in the ordinary manner, and, therefore, require no further description. The valve-seat is shown at G. It is formed in this instance with annular V-corrugations, and the bearing-face of the valve H is formed with corresponding corrugations, so that the two will fit closely together when the valve is down, as represented in Fig. 2.

I have represented the valve-seat with an outside smaller rib, *a*, but this is superfluous, and can be dispensed with.

The effect of this formation of the valve and its seat has been above stated, and requires no repetition here. The object is to give the steam a crooked, zigzag, or sinuous passage, and to this end the corrugations may be formed in various ways, as, for instance, instead of being V-shaped, they may be "round-nosed," square, or of other suitable shape.

The valve and valve-seat, under any and all conditions, must, of course, be so formed that when the valve is down it will fit the valve-seat closely.

Other modifications might be suggested, but the above are sufficient to indicate the variety of ways in which the invention may be carried into effect. But under all circumstances the corrugations must be of such depth that, no matter to what extent the valve may be lifted under the ordinary conditions of use, the oppositely-placed ribs of the valve and valve-seat shall still intercept each other in such manner as to present to the steam a series of deflecting-surfaces, which will force the steam to travel in a zigzag or sinuous path to effect its escape.

The invention is, of course, applicable to

other styles of safety-valve, whether spring or weighted.

Having now described my invention, and the manner in which the same is to be carried into effect, what I claim, and desire to secure by Letters Patent, is—

In a safety-valve, the combination of a ribbed valve-seat and a ribbed valve proper, the same being constructed as herein shown and set forth, so that under any conditions of use the ribs of the valve will intercept the ribs of the valve-seat, in such manner as to force the escaping steam to travel in a sinuous or zigzag path, for the purpose specified.

In testimony whereof I have hereunto signed my name this 18th day of March, 1874.

GEO. H. CROSBY.

Witnesses:

JOHN MAY,

AUGUSTUS SCHULZ.