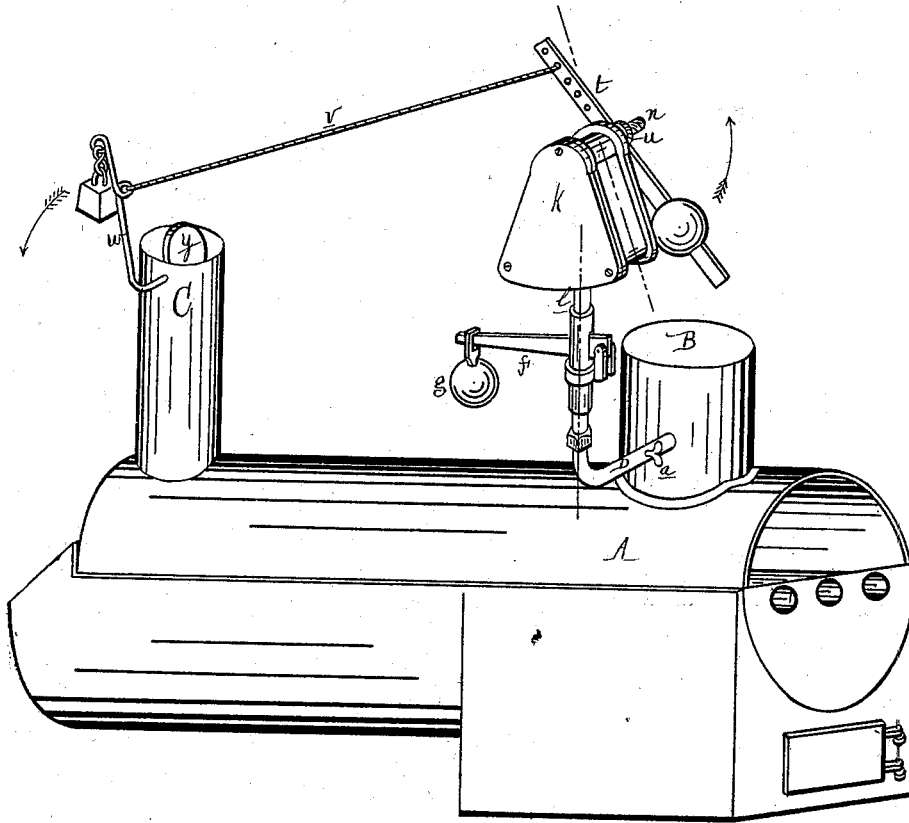


W. R. COLE.
Damper-Regulator for Steam-Boiler Furnaces.
No. 199,692. Patented Jan. 29, 1878.

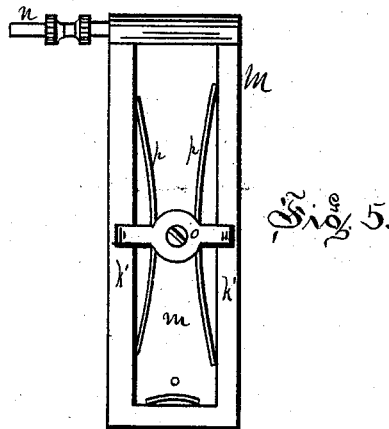
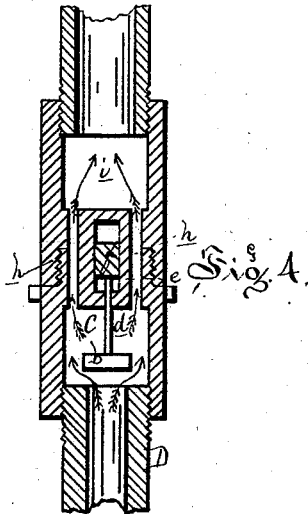
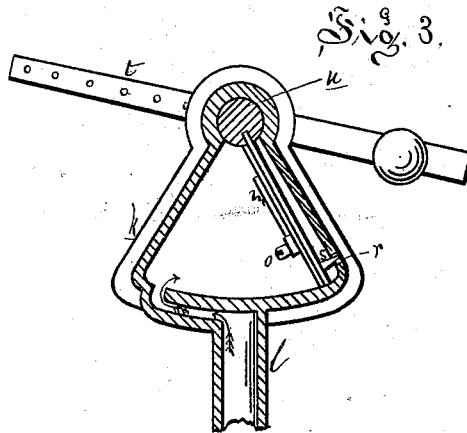
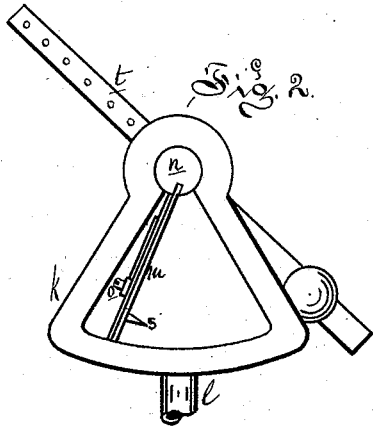
Fig. 1.



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UNITED STATES PATENT OFFICE.

WILLIAM R. COLE, OF DETROIT, MICHIGAN.

IMPROVEMENT IN DAMPER-REGULATORS FOR STEAM-BOILER FURNACES.

Specification forming part of Letters Patent No. 199,692, dated January 29, 1878; application filed November 6, 1877.

To all whom it may concern:

Be it known that I, WILLIAM R. COLE, of Detroit, in the county of Wayne and State of Michigan, have invented an Improvement in Damper-Regulators for Steam-Boiler Furnaces, of which the following is a specification:

The nature of this invention relates to certain new and useful improvements in that class of inventions which are designed to operate the draft-controlling dampers of steam-generators by the pressure of steam through a safety-valve.

The invention consists in the peculiar construction of the safety-valve and its combination with the controlling-valve case; also, in the peculiar construction of the valve in combination with its case and rock-shaft; also, in the combination of the weighted levers and connecting-cord, so arranged that the damper will be overweighted and always remain open, except when operated upon by the steam-pressure in the boiler through the safety-valve and its connections; also, in the combination of the various parts to produce the desired result.

Figure 1 is a perspective view of my improved device as attached to a steam-boiler, showing the damper in the smoke-stack open. Fig. 2 is an elevation of the valve-case with the cover removed. Fig. 3 is a vertical longitudinal section through the valve-case, showing the inlet for steam from the safety-valve. Fig. 4 is a vertical cross-section through the safety-valve, showing its construction and arrangement of one steam-port on each side of the lever, to carry steam to the valve-case. Fig. 5 is a plan view of one side of the valve or wing, showing the method of packing the same.

Like letters indicate like parts in each figure.

In the drawings, A represents the steam-boiler, provided with steam-dome B and smoke-stack C, in the usual manner of construction. A steam-pipe, D, leads from the generator to the safety-valve, and is provided with a valve, *a*, by means of which the flow of steam through the pipe is regulated as desired. A disk, *b*, ground to its seat, forms a valve, which, when seated, prevents a flow of steam into the safety-valve chest *c*. A loose stem, *d*, of proper length, stands upon the upper face of this disk, and

the upper end, projecting upward through the solid end of the pipe *e*, is designed to raise the lever *f*, when the valve is raised by a pressure of steam sufficient to overcome the weight of the sliding ball *g*. When this is done steam escapes from the boiler into steam-chamber *c*, and is conducted, by one or more ports, *h*, on one or both sides of the lever *f*, if desired, into the chamber *i*, whence it is conducted to the wing-valve case *k* through the pipe *l*.

m is a wing-valve, rigidly secured at its upper end to the rock-shaft *n*, properly journaled into the upper end of the case *k*. One face of this wing is provided with two L-shaped strips of metal, *k'*, as shown in Fig. 5, and are secured thereto by means of the clamp *o*, which also holds the springs *p* in place. The office of these springs is to set out the strips, thereby packing the valve.

Under pressure it will be found that some steam will pass to the other side of the wing. An escape for this is provided by the escape-port *r*. When the valve is forced clear back by the pressure from the boiler, a plug, *s*, rigidly secured to the reverse face of the wing-valve, enters and closes this port. The rock-shaft *n* projects through the rear side, and upon it is sleeved the perforated and weighted lever *t*, and this lever is prevented from turning upon the shaft by being between two jam-nuts, *u*, on the projecting end of the shaft, which is threaded for that purpose. The lever *t* is perforated, as shown, for the purpose of changing, if desired, the point of securing the cord *v* nearer to or farther from the fulcrum, (shaft *n*,) and as may be required under varying circumstances. The cord *v* connects this lever with the weighted-lever arm *w* of the damper *y* in the smoke-stack.

It will be readily seen that the greater the pressure of steam the more the damper will be closed, thereby causing the fire to decrease in the furnace. As the pressure is diminished the damper will gradually open, thereby increasing the draft of the furnace.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a damper-controlling device, and in combination therewith, and with a pipe communicating with a steam-generator, and provided with a valve, a safety-valve wherein the

disk-valves *b*, chest *c*, stem *d*, and weighted lever *f* are arranged to operate substantially as described, and for the purposes set forth.

2. In combination with a safety-valve, the port or ports *h* on one or both sides of the safety-valve lever, and in the support thereof, affording communication for the passage of steam from the chest *c* to the chamber *i*, substantially as and for the purposes specified.

3. In combination with the safety-valve of a steam-generator, the triangular and segmental shaped valve-case, provided with inlet and outlet ports, and the wing-valve, rigidly secured to a projecting shaft, substantially as and for the purposes described.

4. In a valve-case, and in combination therewith, the metallic strips *k* and springs *p*, se-

cured to the face of the wing-valve *m* by means of the clamp *o*, substantially as and for the purposes set forth.

5. In a valve-case provided with an outlet-port *r*, the plug *s*, projecting from and secured to the face of a vibrating wing-valve, substantially as and for the purposes specified.

6. In combination with the shaft of a vibrating wing-valve, the perforated and weighted lever *t*, cord *v*, and weighted arm *w* of the damper, substantially as specified, and for the purposes set forth.

WM. R. COLE.

Witnesses:

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