J. FEWKES.

AUTOMATIC DRAFT-REGULATOR.

No. 185,094. Patented Dec. 5. 1876.

Fig: 1.

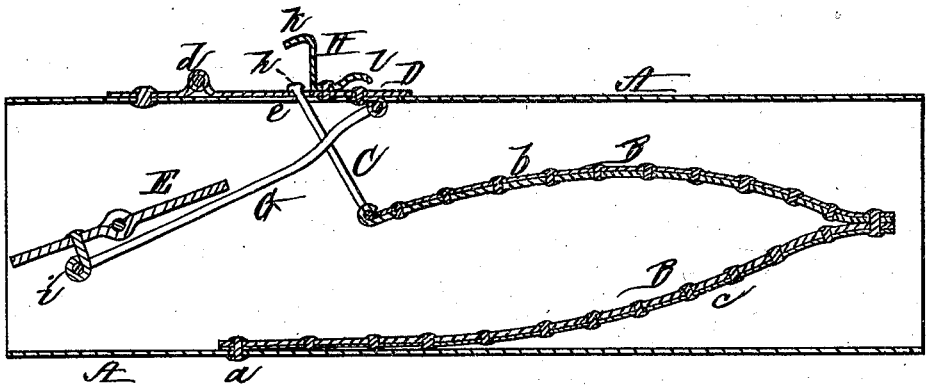
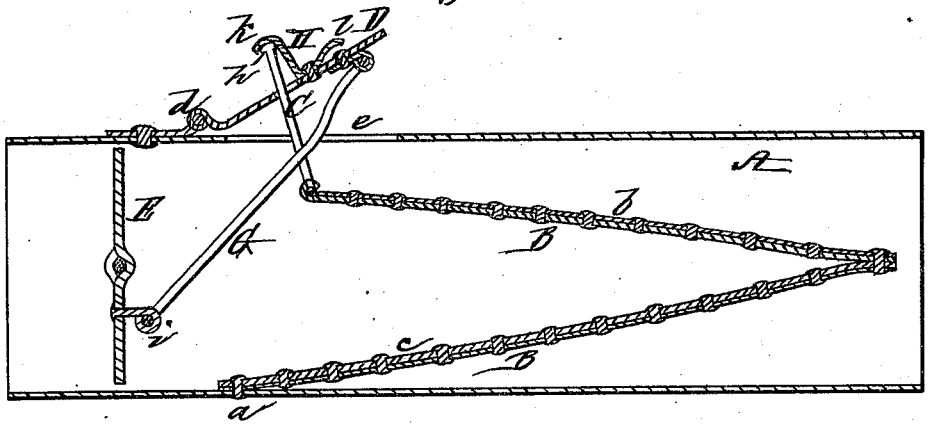


Fig: 2.



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UNITED STATES PATENT OFFICE.

JESSE FEWKES, OF NEWTON, MASSACHUSETTS.

IMPROVEMENT IN AUTOMATIC DRAFT-REGULATORS.

Specification forming part of Letters Patent No. **185,094**, dated December 5, 1876; application filed October 19, 1876.

To all whom it may concern:

Be it known that I, JESSE FEWKES, of Newton, in the county of Middlesex and State of Massachusetts, have invented certain Improvements in Automatic Draft-Regulators for Heating Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a longitudinal section through the smoke-pipe leading to the chimney-flue, and having my improved draft-regulator applied thereto. Fig. 2 is also a longitudinal section through the same, the position of the damper and regulating mechanism connected therewith being changed.

My present invention consists in a spring composed of strips of metal of different expansible properties, secured at one end to the funnel or smoke-pipe leading to the chimney-flue, and connected at the other end with a rod attached to the door of the cold-air passage in said smoke-pipe, another rod being employed for connecting this door with the damper within the smoke-pipe, by which construction and arrangement, as the heat increases or decreases, the spring is caused to buckle and move, and, through its connections with the door of the cold-air passage, causes it to open or close and admit or prevent the entrance of cold air into the smoke-pipe, and also operate the damper therein, whereby the draft is automatically checked or increased, and the heat regulated as desired.

To enable others skilled in the art to understand and use my invention I will proceed to describe the manner in which I have carried it out.

In the said drawings, A represents the funnel or smoke-pipe leading horizontally from the furnace or stove to the chimney-flue. Within this pipe, and secured thereto at one of its ends *a*, is a spring, B, of the form seen, consisting of two leaves or portions, *b c*, riveted together at the end opposite that *a*, where the lower portion *c* is secured to the pipe, each portion being composed of two strips of metal possessing different capacities of expansion under the same temperature, the inner strip of each portion being of brass and the outer strip of iron or steel, the brass expanding by an increase of heat much more than the iron or steel, and causing the two leaves or portions to straighten or have a tendency to approach a straight line, and a reduction of heat causing the brass to contract more than the iron or steel, and thus bend or curl the two leaves together, for a purpose presently to be explained. To the upper portion *b*, at its free end, immediately over the end *a* of the lower portion *c*, is connected the lower end of a rod, C, the upper end of which passes through a hole formed in a door, D, hinged at *d* to the outside of the smoke-pipe, and closing a rectangular passage, *e*, formed therein for the admission of the external cold air, the upper end of this rod C being provided with a head, *h*. E is an ordinary circular or disk damper, pivoted (at points diametrically opposite each other) within the smoke-pipe. From a point a little to one side of the center of this damper projects an arm or crank, *i*, to the outer end of which is pivoted the lower end of a connecting-rod, G, the upper end of which is attached to the inside of the outer end of the door D controlling the cold-air passage in the smoke-pipe. To the outside of this door, at or near its center, is pivoted a swiveling latch, H, provided with two bent portions, *k l*, which serve as stops to limit the upward play of the head *h* of the rod C, the stop *k* being farther removed from the outside of the door than the stop *l*, the stop *k* being swung over in line with the head *h* in cold weather, and the stop *l* being swung thereover in warm weather, as will be more fully set forth.

The parts being represented in the position seen in Fig. 1, with the damper E open and the cold-air door D closed, an increase of heat causes the free end of the upper portion *b* of the spring to rise and recede from the fixed end *a* of the lower portion *c*, and the rod C is elevated thereby till its head *h* comes into contact with the under side of the stop *k*, (the one employed in cold weather,) when the cold-air door D is swung open and a current of cold air is admitted, the opening of this door simultaneously turning the damper E in the funnel, so as to close the opening therein, and thus check the draft as desired.

As the temperature of the spring is reduced

by the admission of the cold air, the former gradually vibrates back into its previous position and the rod C descends, thus permitting the cold-air door D to again close and the damper E to open, as before, by which arrangement the draft is automatically regulated as desired.

When a fire is started the swiveling latch H is swung into a position to bring both its stops out of line with the rod C, thus allowing it to slide through the door without opening the same, and allowing the smoke and gases to pass off up the chimney.

In moderate weather, where but little heat, and, consequently, less draft, is required, the cold-air door D is opened and the damper E closed more quickly by bringing the stop *l* around in line over the head of the rod C; but in cold weather, where considerable heat is wanted, and, consequently, more draft, the stop *k* is swung around in line over the rod C, the opening of the cold-air door and the closing of the damper being delayed longer than where the stop *l* is used in connection with the rod C. I prefer to make the surface of the under side of the stops *k l* slightly curved, as thereby the head *h* of the rod C is enabled to move more freely thereunder than were this surface straight.

Instead of the swiveling latch H, provided with two stops, a swiveling latch having a continuous spiral may be employed, the head *h* of the rod C abutting against the under side of the inclined surface of the spiral, and a nut and screw being employed for clamping the latch when adjusted in place; and instead of riveting the parts, they may be secured together by brazing.

Where the length of the smoke-pipe A is necessarily short, owing to the limited space between the furnace and chimney-flue, I am obliged to employ a shorter spring, composed of more than two leaves or portions, in order to secure sufficient motion to operate the rod C, leading to the cold-air door D.

My automatic heat-regulator is of simple construction, can be readily applied without skilled labor to either new furnaces or stoves, or to those already in use, at a trifling cost, is more sensitive, and consequently will act more promptly than other heat-regulators of this class, besides which, owing to its inclosed position, it is not liable to be tampered with and injured by ignorance or carelessness.

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

1. A spring, B, composed of strips of metal of different expansible properties, in combination with mechanism for connecting it and the damper E with the cold-air door D of the smoke-pipe A, operating substantially in the manner and for the purpose described.

2. The spring B, rod C, and door D, in combination with the damper E, rod G, crank or arm *i*, and swiveling latch H, with its stops *k l*, operating in the manner and for the purpose set forth.

Witness my hand this 13th day of October, A. D. 1876.

JESSE FEWKES.

In presence of—
N. W. STEARNS,
P. E. TESCHEMACHER.