3 Sheets—Sheet 1.

G. JOSLIN.

Damper.

No. 34,503.

Patented Feb. 25, 1862.

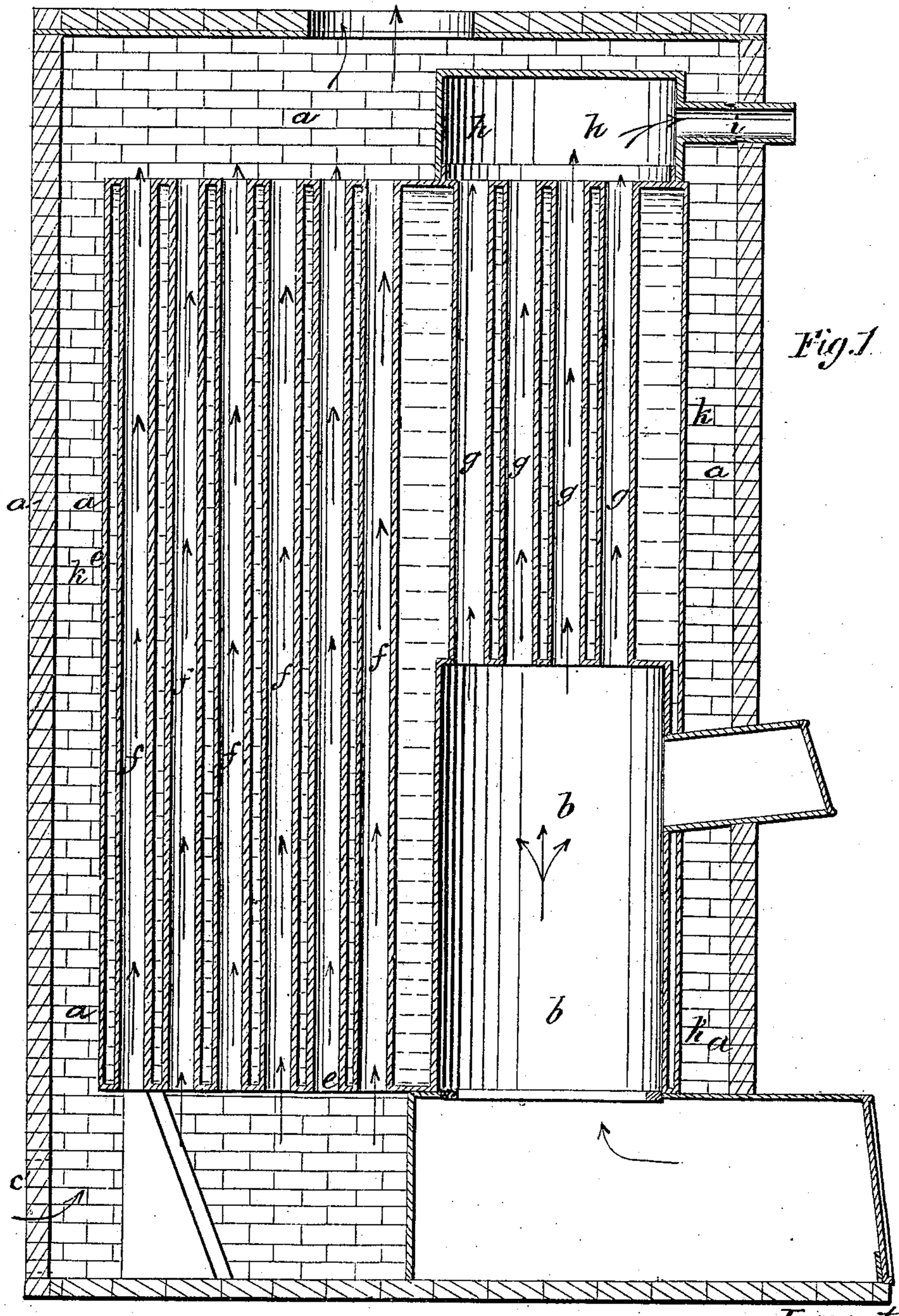

Fig. 1.

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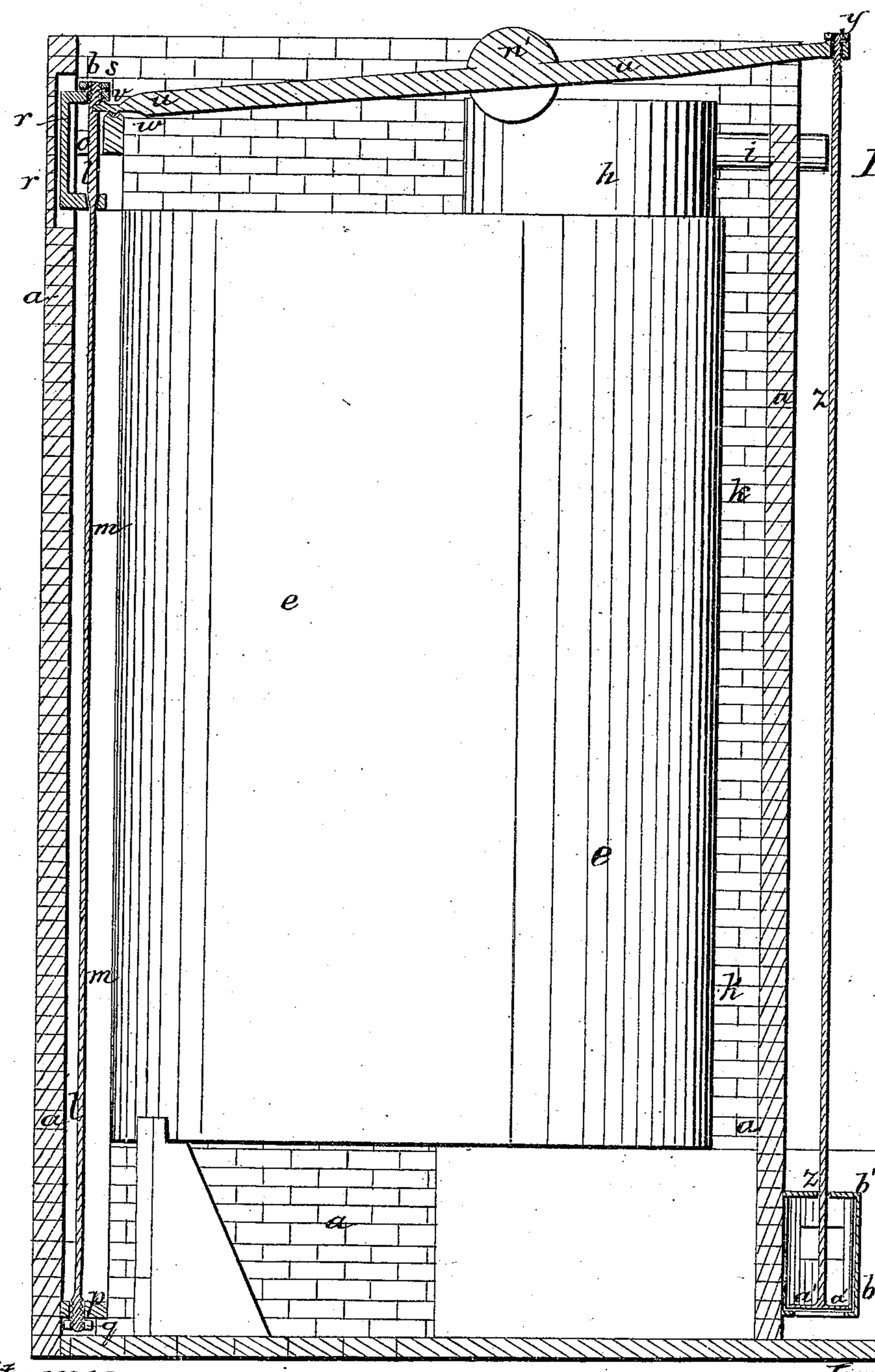

Fig. 2.

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No. 34,503.

Patented Feb. 25, 1862.

Fig. 3.

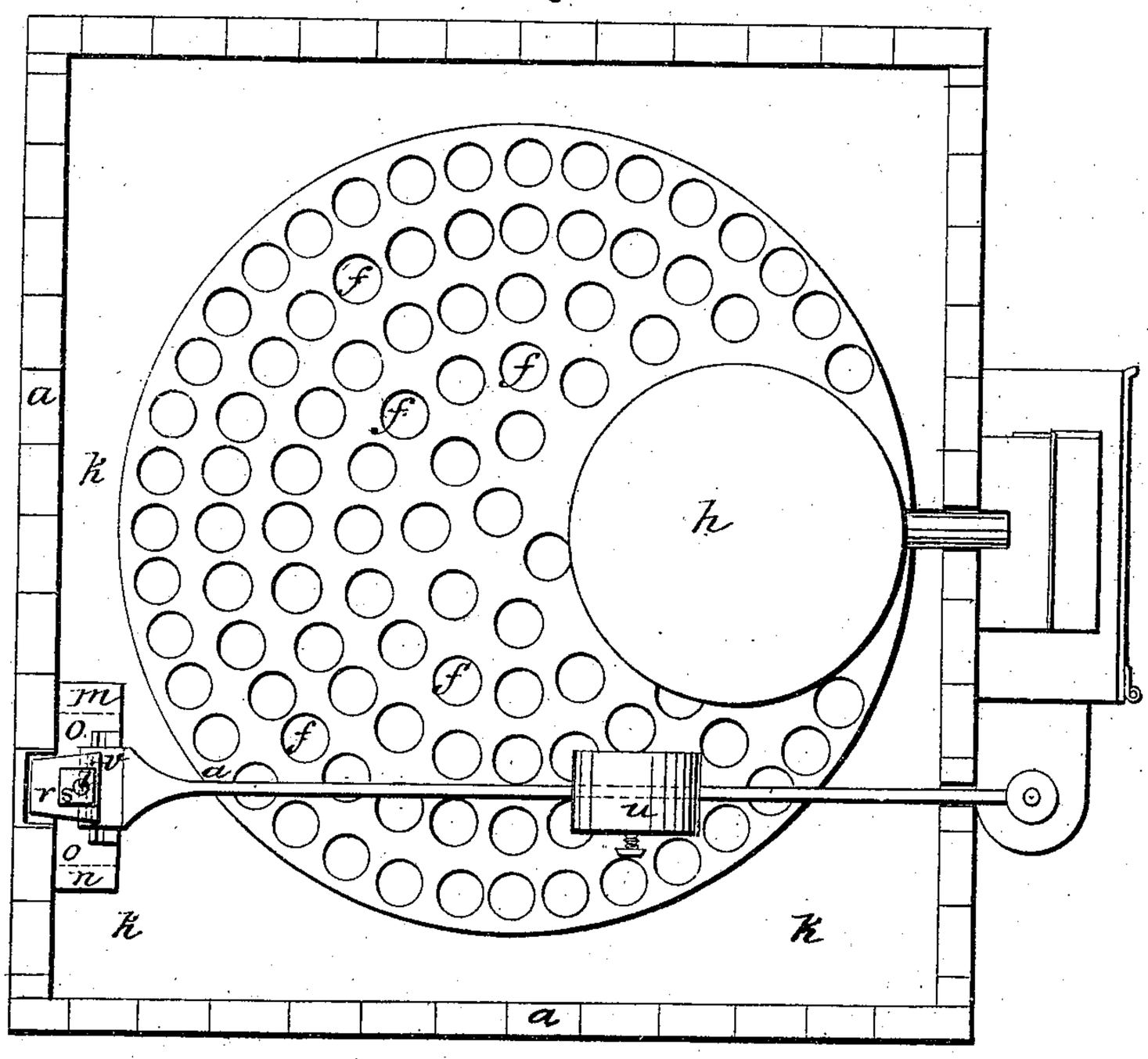


Fig. 4.

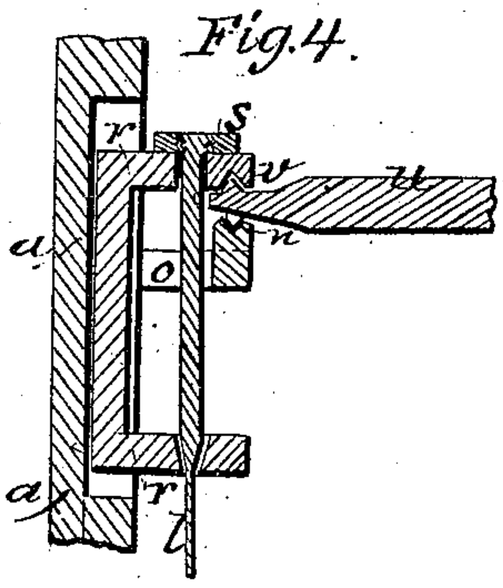
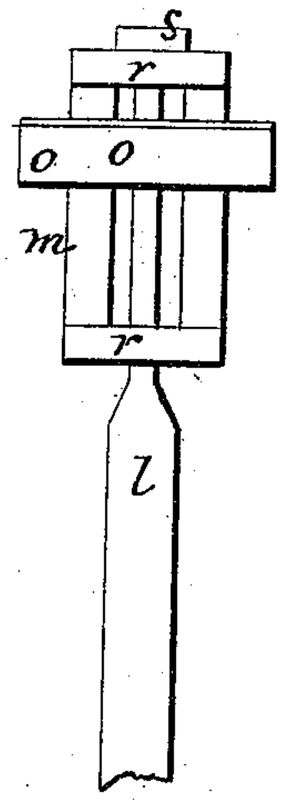


Fig. 5.



Witnesses.

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UNITED STATES PATENT OFFICE.

GILMAN JOSLIN, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN HEATERS.

Specification forming part of Letters Patent No. **34,503**, dated February 25, 1862.

To all whom it may concern:

Be it known that I, GILMAN JOSLIN, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Heating Apparatus; and I do hereby declare that the following description, taken in connection with the accompanying drawings, hereinafter referred to, forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said improvements, by which my invention may be distinguished from all others of a similar class, together with such parts as I claim, and desire to have secured to me by Letters Patent.

The figures of the accompanying plate of drawings represent my improvements.

Figure 1 is a central longitudinal vertical section of my improved heating apparatus. Fig. 2 is also a vertical section taken in the plane of my improvements for regulating the heat of the apparatus. Fig. 3 is a plan or top view. Figs. 4 and 5 are detail views, to be hereinafter referred to.

In the construction of furnaces and other heating apparatus several arrangements of devices have heretofore been experimented with for the purpose of rendering them self-regulating; but these attemps have been confined to the object of keeping up a uniform temperature in the heating apparatus itself or else simply to the closing of the smoke-damper when the fire became kindled.

My invention contemplates a different object—viz., that of varying the degree of heat in the heating apparatus by the temperature and quantity of external air admitted thereto—whereby the apartments themselves will be kept at a uniform heat whatever may be the number to which hot air is to be supplied or the degree of cold without doors.

The manner in which I effect the object of my improvements is as follows: I arrange a bar, rod, or plate of metal within the outer casing of the furnace in such a manner that the external air admitted thereto shall pass in the direction of the length of the rod, bar, or plate and in contact therewith and become heated during its passage. The expansion and contraction of this rod, bar, or plate, according to the quantity and temperature of cold admitted, is made by a series of devices to open and close a damper that regulates the draft of the fire.

I will next proceed to describe in detail a furnace having my improvements applied thereto and possessing novel peculiarities that will be hereinafter fully explained.

a a a a in the drawings represent the outer casing or brick-work of a furnace.

b b is the fire-pot, *c* the feeding-chamber thereto, and *d d* the ash-pit. The fire-pot *b b* is inclosed within a metallic casing *e e e*, containing a series of air-tubes *f f f*, &c., and a series of water-heating tubes *g g*, &c. The products of combustion after passing through the tubes *g g*, &c., escape into a drum *h* and find their exit through a smoke-pipe *i*. The entire space around the series of tubes *f f* and *g g*, &c., and also around the fire-pot, is filled with water, which completely surrounds the said tubes. Between the outer brick-work *a a* of the furnace and the metallic casing *e e e* is left a narrow chamber or space *k k*, within which is placed a metallic rod or bar *l l*, between two fixed standards *m m n n*, united at the top and bottom by cross-bars *o p*. The lower portion of the bar *l l* is secured by a nut *q* under the cross-bar *p*. The upper portion passes through a guiding-stirrup *r r*, and has on its top a nut *s*, that bears upon the top of the stirrup *r r*. Between the under side of the upper plate *t* of the stirrup *r r* and the top of the cross-bar *o* is inserted the end of a lever-arm *u u*, the projections *v w* of which, Fig. 4, are respectively inserted in corresponding sockets in the plate *t* of the stirrup *r r* and the cross-bar *o*. On the lever-arm *u u* at any desired point is placed a sliding weight *u'*.

The object of hanging the lever-arm *u u* in the manner described, by means of the projections *v w* and their sockets, is to permit the ready removal of the said lever-arm in case it may be desirable to take it out for repairs or other purposes. The end of the lever-arm *u u* has passed through and secured to it by means of a screw-nut *y* a long rod *z z*, to the end of which is secured a valve or damper *a'*, moving in a box *b'*, that communicates directly with the ash-pit *d d*, the extent to which the damper *a'* is opened regulating the draft to the fire.

External or cold air is admitted to the furnace through an aperture *c'* in the brick-work

a into the chamber or space *k k*, and so as to come in contact both with the rod or bar *l l* and the heated casing *e e*. The temperature at which the air enters through the aperture *c'* will of course produce either an expansion or contraction of the rod *l l*, as the case may be. Thus if air enters at a temperature of zero Fahrenheit, the rod *l l* will contract in the direction of its length, (provided the air previously in contact with it has been at a temperature above zero,) and thus by means of the lever-arm *u u*, rod *z z*, &c., open the damper *a'*, and thereby increase the draft of the fire. The volume or quantity of air admitted through the aperture *c'* will also vary the expansion and contraction of the plate *l l*, as the depth of the stratum of external air that immediately comes in contact with the plate will be increased or diminished in proportion to the supply drawn in, and thus if more apartments are to be warmed the opening of their valves or registers will increase the supply of external air to the furnace, and thereby open the damper *a'* accordingly. In the same way when the external air becomes warmer or fewer apartments require the heated air and have their communication with the furnace closed, the bar or plate *l l* will expand and close the damper *a'* in proportion to the said expansion. By thus regulating the fire in the fire-pot just in proportion to the temperature of the external air and to the quantity of such air admitted to the apparatus, it will be evident that the temperature of apartments can be always kept at a uniform and any stated degree of heat, and that this regulating of the furnace will be effected by the action of the apparatus itself, so that when once set the parts will require no further adjustment.

The set-screw *y* is used for regulating the rod *z z*, so that the damper *a'* will be raised or lowered more or less by the action of the lever-arm *u u*, and the weight will, it is evident, according to the different positions in which it is placed on the said arm, regulate the extent of its movement.

Having thus described my improvements, I shall state my claims as follows: What I claim as my invention, and desire to have secured to me by Letters Patent, is—

1. Varying the temperature of the fire just in proportion to the quantity and temperature of the external air supplied to the furnace by means of a rod, plate, or bar so arranged as to have the air so admitted keep in contact with it and cause the expansion and contraction of the said rod, plate, or bar, thereby regulating the draft of the fire, as set forth.

2. In heating apparatus constructed to operate substantially as herein set forth, the arrangement of the lever-arm so that it can readily be inserted in or removed from its place by providing said lever with the projections *v* and *w* to fit into suitable sockets in the pieces which compose its fulcrum, as described.

GILMAN JOSLIN.

Witnesses:

JOSEPH GAVETT,

A. W. BROWN.