

M. D. WELLMAN.

Fireplace.

No. 60,601.

Patented Dec. 18, 1866.

Fig. 1

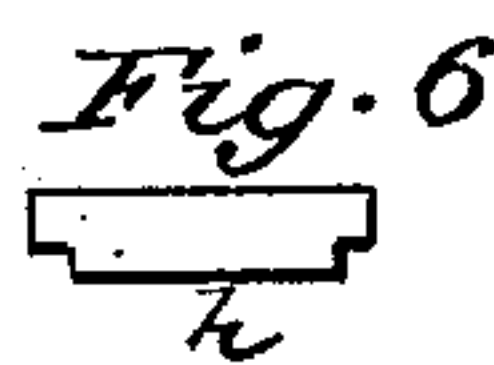
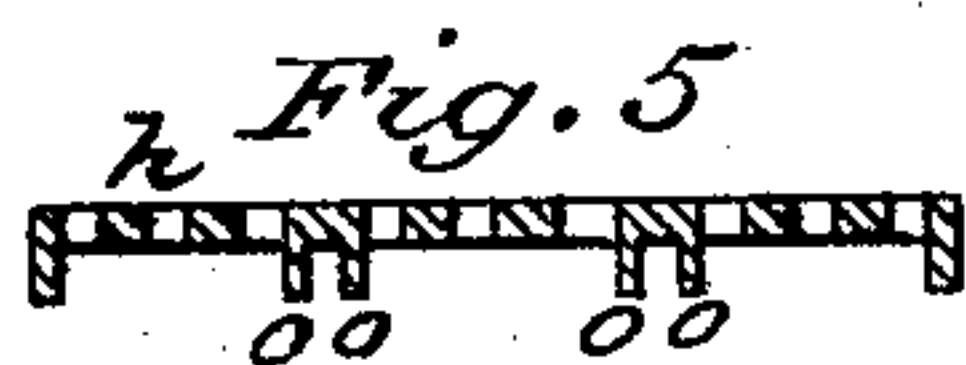
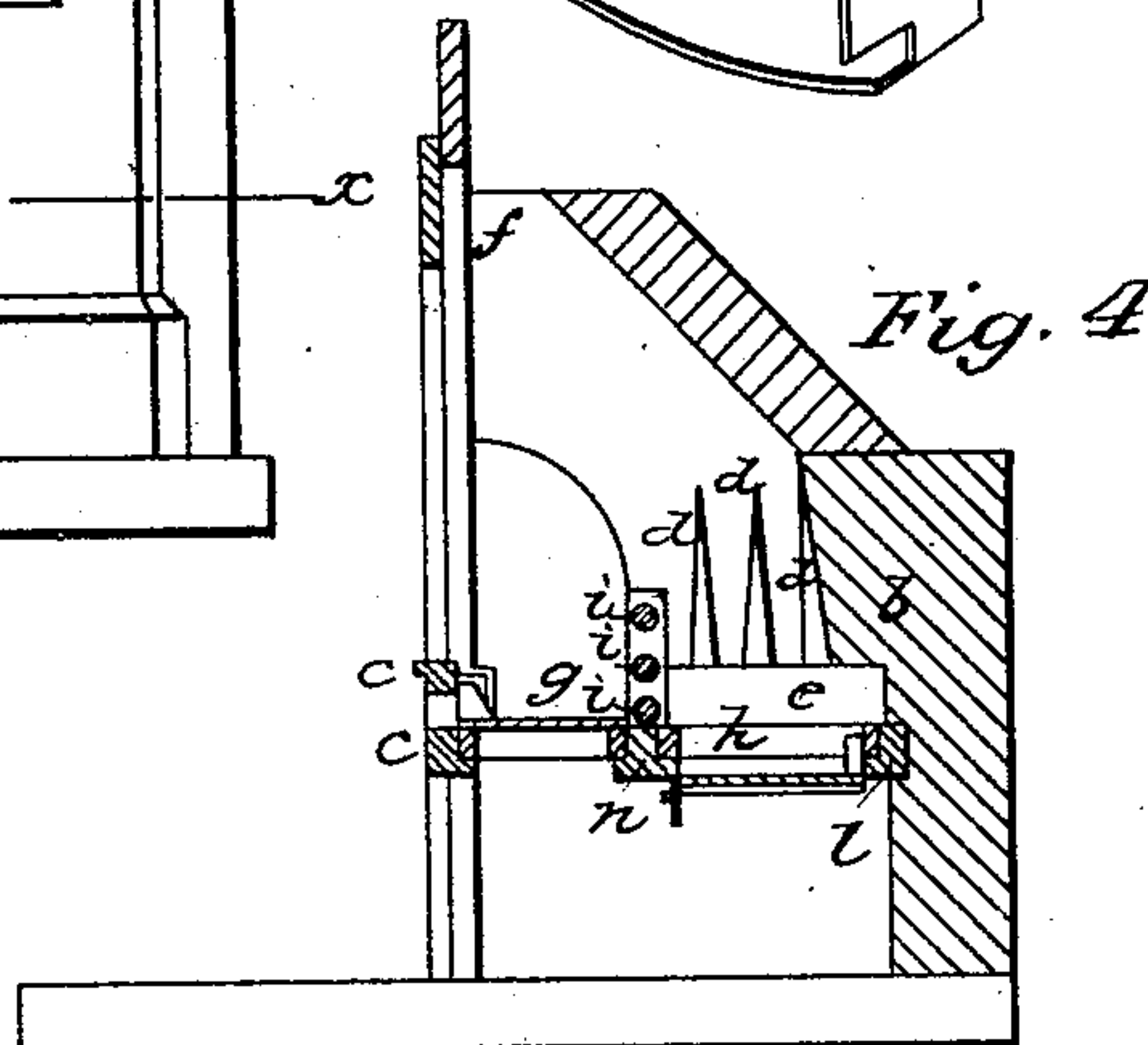
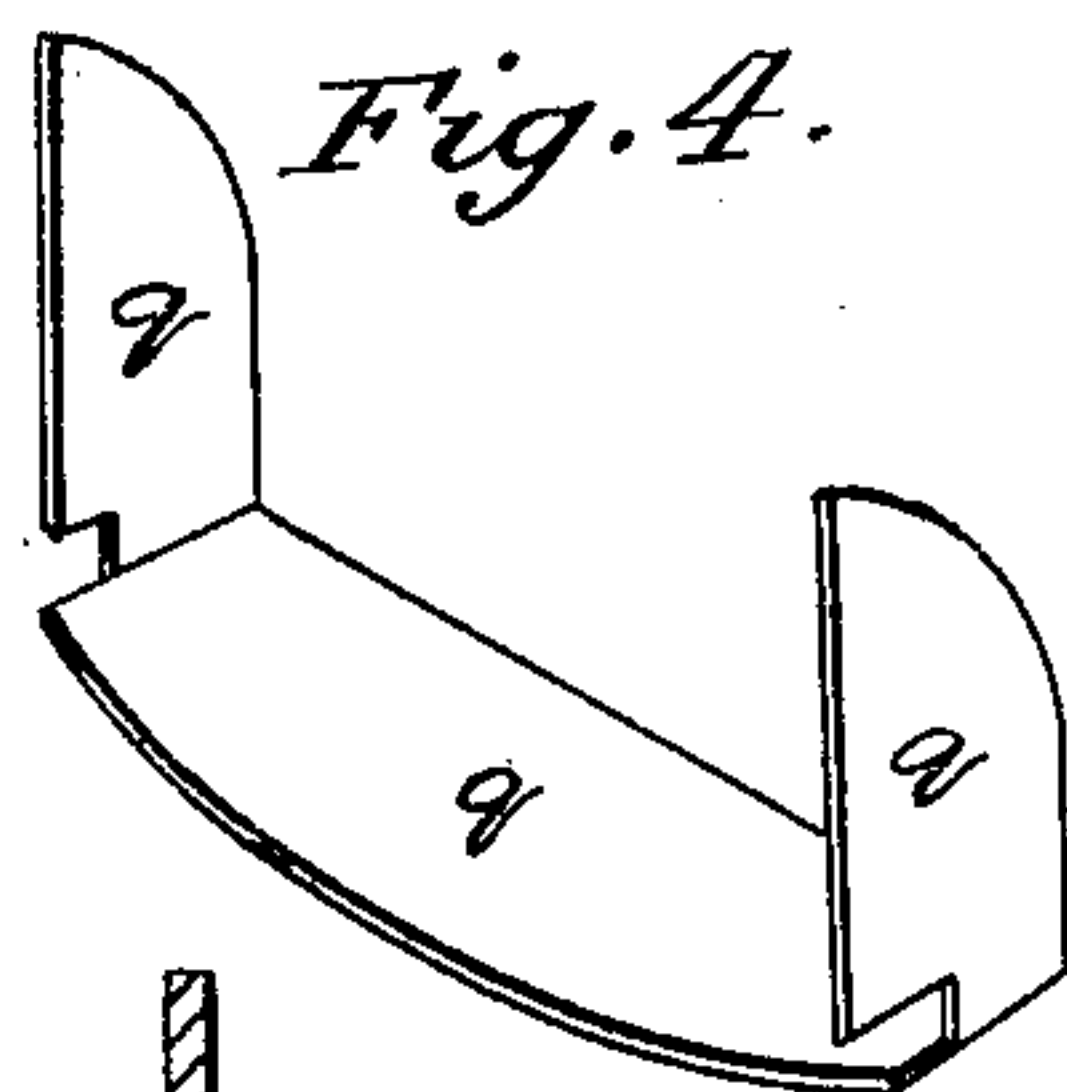
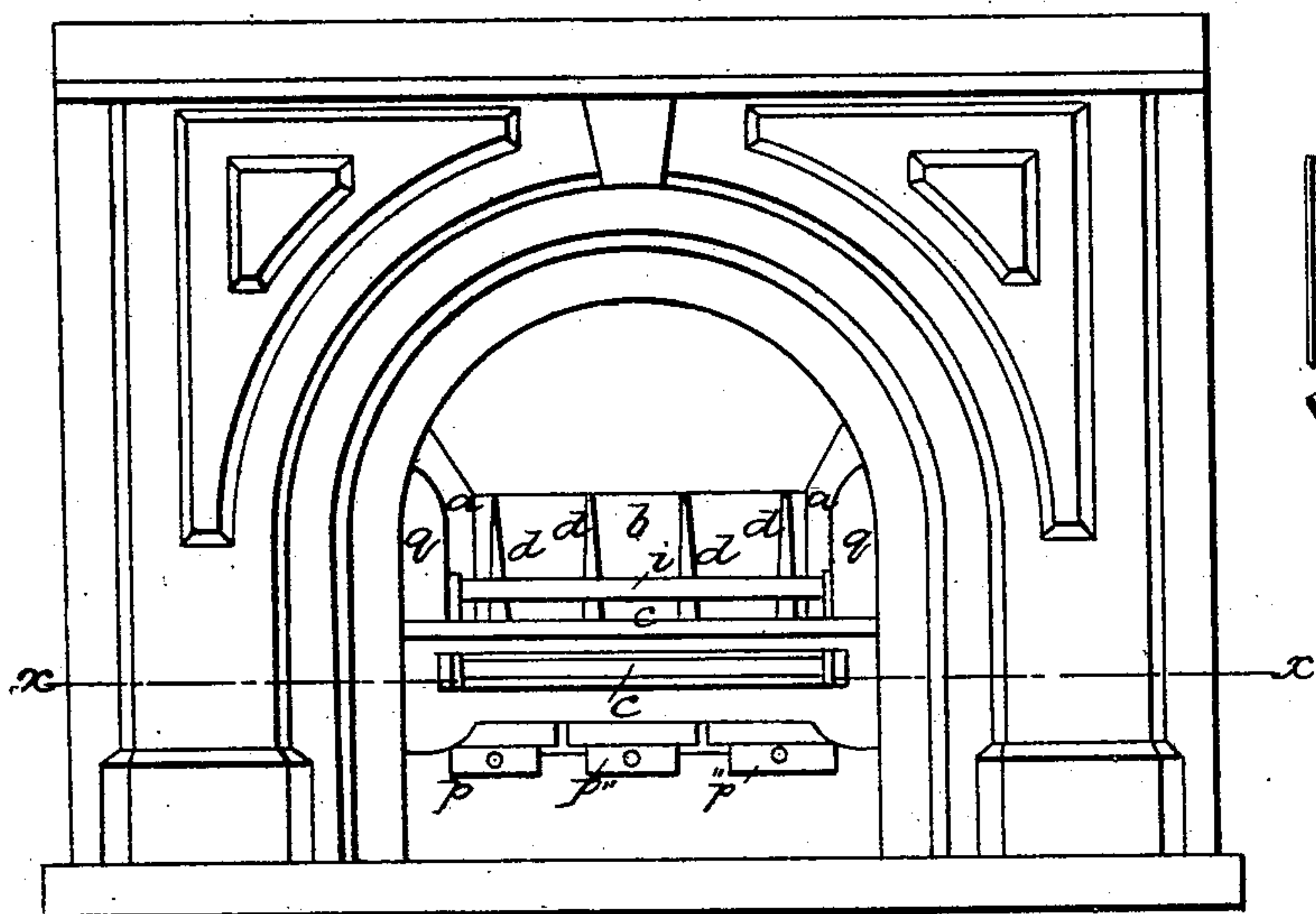


Fig. 7

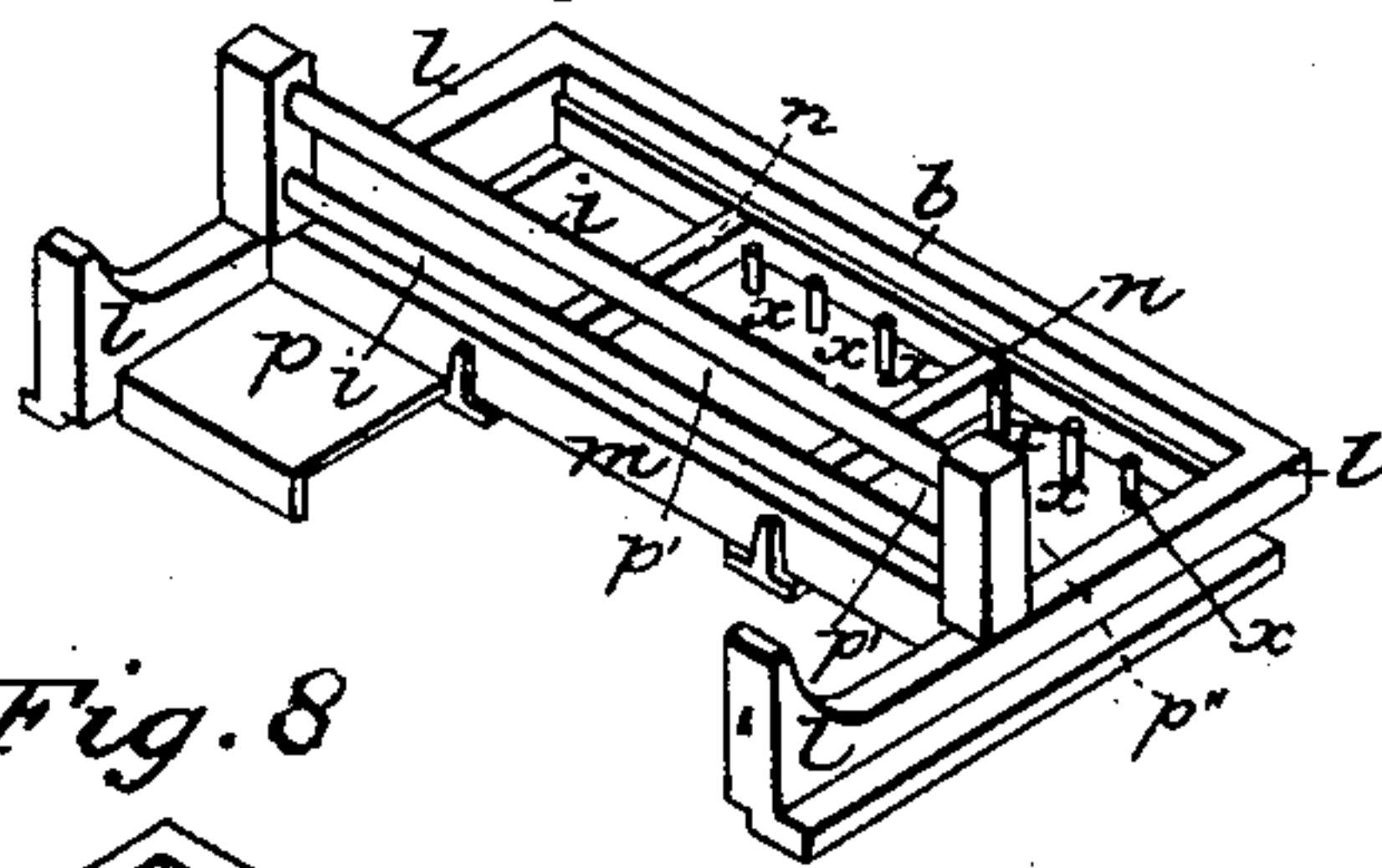
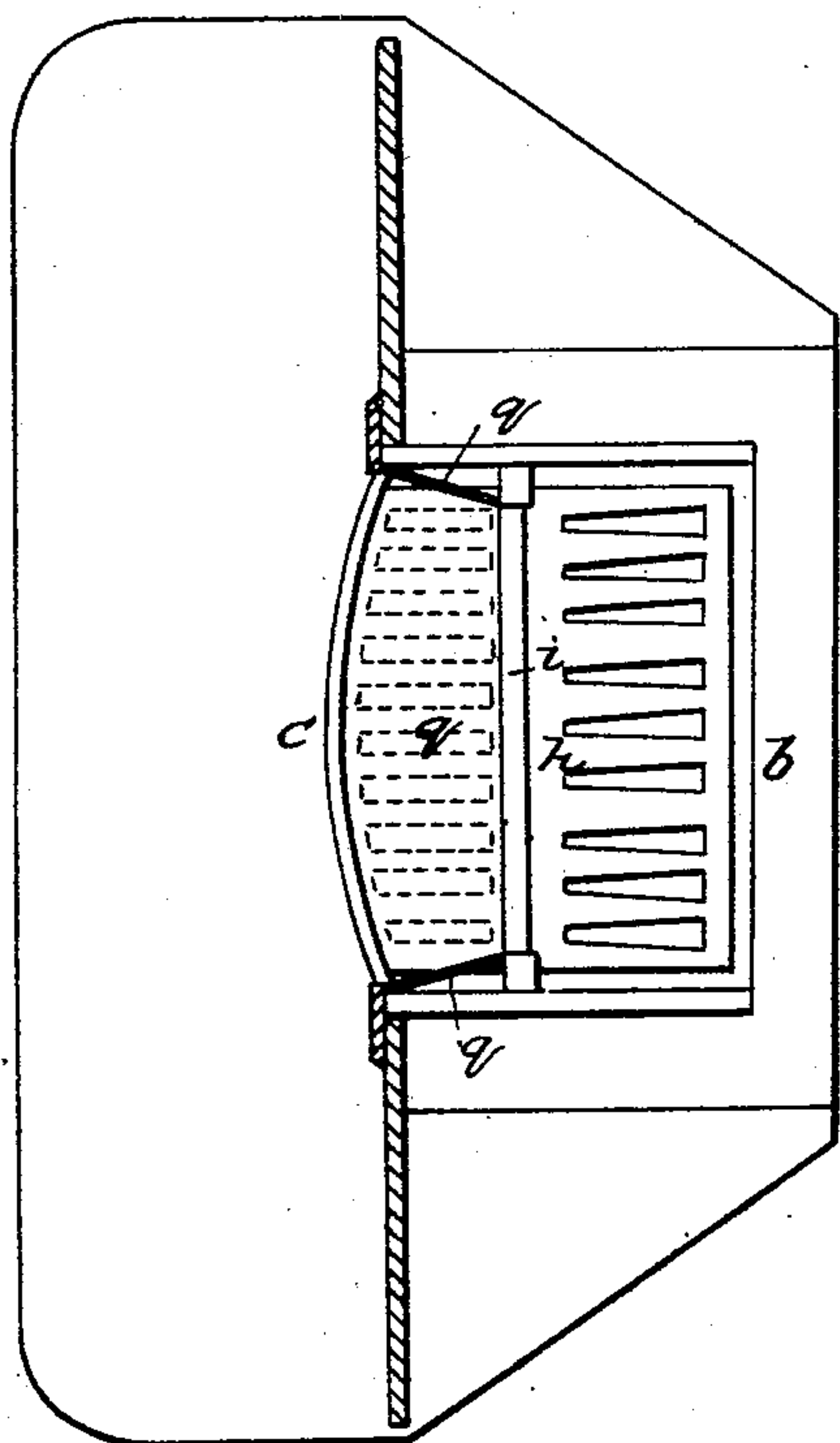
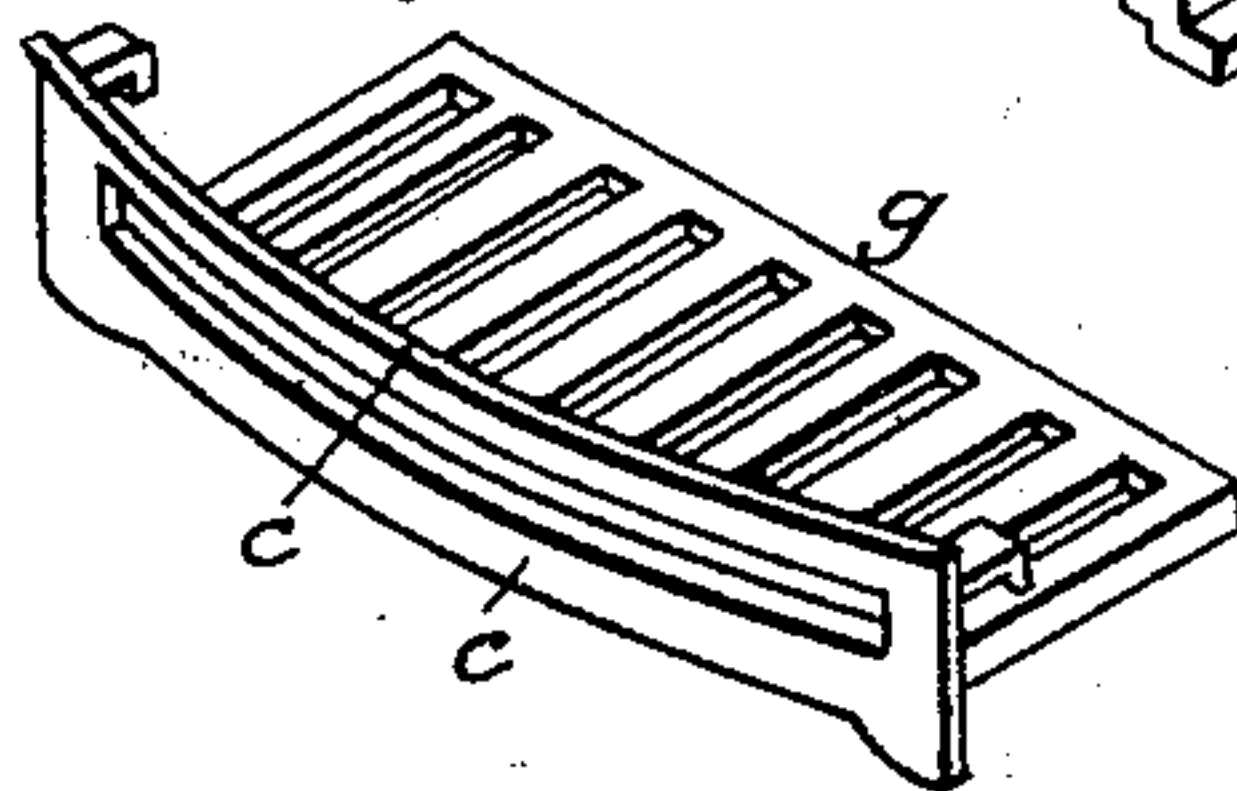


Fig. 8



Witnesses:

W. D. Lewis.  
Geo. H. Christy

Inventor:

Marshall D. Wellman  
by his attys Bakewell & Christy



# United States Patent Office.

## IMPROVEMENT IN OPEN FIRE-PLACES.

MARSHALL D. WELLMAN, OF PITTSBURG, PENNSYLVANIA.

*Letters Patent No. 60,601, dated December 18, 1866.*

The Schedule referred to in these Letters Patent and making part of the same.

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, MARSHALL D. WELLMAN, of Pittsburg, in the county of Alleghany, and State of Pennsylvania, have invented a new and useful Improvement in Open Fire-Places; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a front view of my improved fire-place.

Figure 2 is a horizontal section through the line *z z* in fig. 1.

Figure 3 is a vertical section through the middle of the fire-place.

Figure 4 is a perspective representation of the reflector.

Figure 5 is a transverse vertical section; and

Figure 6, a side view of the rear grating.

Figure 7 is a perspective view of the grating frame; and

Figure 8 is a perspective view of the front fire-basket.

In the several figures, like letters denote similar parts.

My invention consists of certain improvements in the construction of fire-places, the first of which relates to the mode of regulating the admission of air to the fire through the fire-bed or grating, so as to control with great certainty and precision the combustion of the fuel; the second relates to the contracting or enlarging of the fire-chamber so as to adapt the size of the fire to the requirements of the varying degrees of temperature; and the third, to the mode of increasing the radiation of heat from an open fire into the apartment by means of reflectors placed in front of the fire.

To enable others skilled in the art to construct and use these improvements, I will proceed to explain the construction and operation of my improved fire-place.

In the drawings accompanying this specification, the side walls *a a* of the fire-place are perpendicular, as is also the back wall, *b*, to the height of a few inches above the level of the top of the front grate-bars *c*. The side and back walls are furnished with tapering flutes, *d*, for the passage of air around the rear of the fire, and with a shallow recess, *e*, around the back and sides, for the same purpose; the recess *e* and flutes *d* being constructed and arranged as described in Letters Patent heretofore granted to me. The back wall, from a point a few inches above the top of the front grate, *c*, slopes at an angle of about forty-five degrees forward, so as to incline over the fire, leaving a narrow passage at *f*, near the front wall of the chimney, for the smoke and gases to pass up into the flue. The grating of the fire-bed may be made either in one or more parts. In the drawing it is shown as made in two pieces, *g* and *h*. The forward piece, *g*, of the grating has horizontal front bars *c*, and is made like an ordinary fire-basket with low front. The rear piece, *h*, extends horizontally about half way from the back to the front wall, and the grate-bars *i*, which serve to enclose the fire within the limits of the rear grating *h*, form a separate piece, which is set, as shown in fig. 7, vertically on the grating frame *l*, at the front edge of the grating *h*, parallel to the back wall, and supported in recesses in the side wall of the fire-place. The distance at which the intermediate grate-bars, *i i*, are placed from the back wall may be so varied as to enlarge or diminish the capacity of the fire-space by making a number of recesses in the side walls to receive the ends of the grate-bar piece. The front and rear grating, *g* and *h*, are both supported on a cast-iron frame, set in the brickwork of the fire-place just below and on a level with the lower edge of the horizontal recess *e*. The construction of the grating frame, *l*, is shown in fig. 7; the rear grate-bars being a separate piece, so as to be removable for the purpose of enlarging the fire-space. The grating frame is divided into two parts by the transverse bar *m*, forming a receptacle for the rear grating or fire-bed *h*. The space covered by the rear grating is subdivided by cross-strips *n n*, shaped like an inverted-T bar, and thus forming ways for the dampers, *p p' p''*, to slide in. These dampers are plates of metal sliding between the cross-strips, *n n*, under the rear grating *h*, which, when pushed backwards, just cover the under side of the rear grating, without, however, coming in contact with the bars of the grating; so that by the falling of ashes between the bars, the plates may be covered over and protected from the heat, and at the same time the passage of air prevented without the necessity of fitting the dampers too closely in their frame. The rear grating is furnished with flanges, *o o*, projecting downwards from its under side at each end, and also on each side of the cross-strips, *n n*, of the frame, so that these strips, *n n*, are thus arched over and protected from the fire, and the lower edges of the flanges, *o o*, serve to keep the dampers down to their place. The flanges *o o*, extending down so as to cover the cross-strips, *n*, of



the frame *l*, form partitions between the dampers, and serve to prevent the passage of air, when one of the dampers, *p*, is open through the grating over the other dampers, *p' p''*, which are closed; so that the opening of one damper admits air only to that part of the grating which is directly over the uncovered portion. Near the edge of the dampers *p*, at the rear end, are pins *x x*, which project upwards through the openings between the bars of the grating *h*; and when the dampers are drawn forward to admit air to the fire, these pins rake out the ashes and clinker just so far as the grating is uncovered, and no further. The pins also prevent the dampers from being drawn out of their slides. The front grate or fire-basket, *g*, may be entirely removed, if desired, leaving only the rear grating, *h*, and grate-bars, *i*, to form a fire-basket in the hinder part of the fire-place; or, as a matter of ornament, the front grate-basket may be retained while fire is built only in the rear fire-space. If a larger fire is desired, the intermediate grate-bars, *i*, may be removed, and the whole fire-space between the front bars, *c c*, and the back wall filled with fuel, or the intermediate grate-bars may be placed nearer to or further from the back wall of the fire-place, as before stated.

In fire-places of ordinary construction the air gets access chiefly to the front of the fire, and the coal at the rear becomes packed down, so that it burns comparatively slowly, and with little effect. In my improved fire-place the recess, *e*, and flutes, *d*, serve to admit the air to the back of the fire, and cause it to burn freely; but unless this quantity of air thus admitted be easily controlled, the fire would burn away too rapidly, and would often become too hot. It is very desirable, in open fire-places, to be able to dampen the fire down, so as to keep it in over night, without its giving out much heat, and to cause it to burn up rapidly when desired. This effect is attained with the greatest ease by the construction and arrangement which I have described. The fire being built either in the rear portion of the fire-space on the grating, *h*, only, or over the whole fire-space, covering the front grating, *g*, as well as the grating *h*, according to the size of the fire desired, the rapidity of combustion of the fuel is regulated by opening or closing, more or less, one or more of the dampers *p*. When the dampers are all closed, by pushing them back, as in fig. 3, the ashes falling on the dampers through the interstices of the grate, close all the joints, and prevent the passage of any air into the fire through the rear grating *h*. When this is the case, the fuel will cease to burn away rapidly, while it will retain sufficient fire to prevent its entirely dying out for several hours. When it is desired that the fire shall burn up, the dampers are drawn forward, more or less, according to the rapidity with which the fire is desired to burn; and when this is done, the ashes which closed the spaces between the bars fall down and leave the necessary air passages. The dampers, when drawn forward, open a passage for the air at the back part of the fire into the recess *e*, and directly in front of the back wall. The advantage of thus admitting the air at the back of the fire-place, through the grating or fire-bed, is that the greatest consumption of fuel will take place, and the intensest heat be created, close to the back wall, which will thereby be kept hot and free from soot; and which will cause a greater radiation of heat into the apartment than if the hottest fire were, as usual, in the front part of the fire-basket. A single damper, extending across the entire width of the grate, may be used; but it would be more liable to warp, and by dividing it up into two or three, the fire may be caused to burn more rapidly in one part of the grate than elsewhere. When the rear portion only of the fire-space is used, and the grate-bars, *i*, are in place, a reflector, *q*, made of burnished steel, tin plate, or other metal having a smooth and polished reflecting surface, is placed in front of the grate-bars *i*, covering the grating *g*, or occupying its place if it be removed, and also extending up each side of the fire-place immediately forward of the fire. The shape of this reflector will depend, of course, on the shape of the fire-place in which it is used. Its construction is shown in fig. 4. When there is a bright fire in the rear grate or fire-space, a great deal of heat will be reflected into the apartment, which would otherwise be lost to the purposes of warming the room by the use of the reflector, which also serves to increase the brilliancy and cheerful appearance of the fire.

The result which I have in view, and attain by the use of the dampers, *p*, as applied to a fire-place or furnace in which the fire is placed upon grate-bars having interstices or holes for the admission of air, is not only or chiefly to regulate the quantity of air admitted from time to time to the fire, as this might be effected by means of an enclosed air-space under the fire, with an aperture or apertures susceptible of being opened or closed, and which, when open, would admit air equally to all parts of the fire; but by placing the dampers close to the grate-bars, or so near thereto as that the spaces between them will become closed with ashes, and by dividing the area of the fire bed into sections, by the use of more than one damper, to admit air to a certain portion only of the fire-bed, the extent of which is regulated by the amount of space of the grating which is uncovered by the damper; the advantage of this arrangement being that the fuel may be made to burn in that part of the grate which is thus uncovered, while it remains dead elsewhere; and, also, that the draught of air has more effect on the fire when it is admitted through a small aperture directly into the fire than when first entering a larger space before reaching the fire.

Having thus described my improvement in fire-places, what I claim as my invention, and desire to secure by Letters Patent, is—

1. The use of a damper or dampers, so constructed and arranged, relatively, to the grate-bars of a fire-place or other furnace as that the area of the opening between the bars for the admission of air into the fire shall be increased or diminished by the operation of the damper or dampers, substantially as hereinbefore described.
2. The use of a reflector or reflectors placed in front of and within the fire-chamber of an open fire-place, substantially as and for the purpose hereinbefore set forth.

In testimony whereof, I, the said MARSHALL D. WELLMAN, have hereunto set my hand in presence of—

MARSHALL D. WELLMAN.

Witnesses:

ALLAN C. BAKEWELL,

A. S. NICHOLSON.