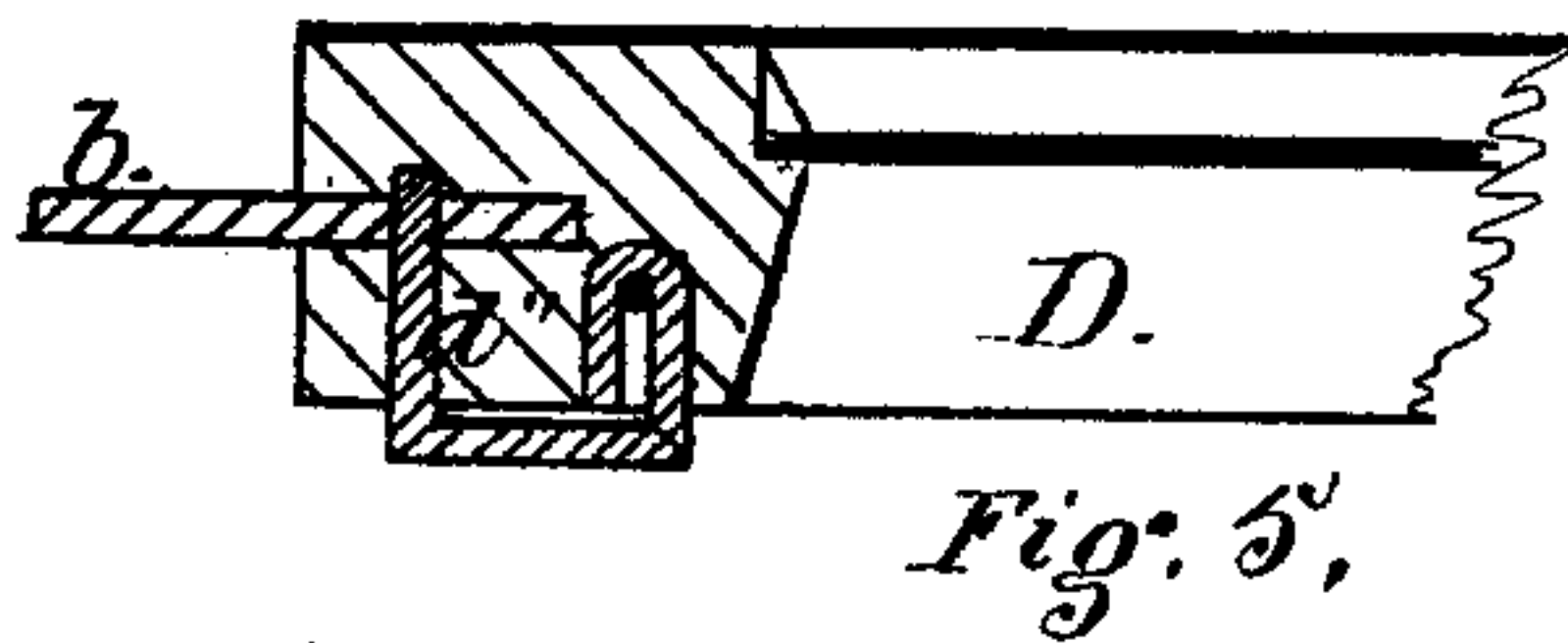
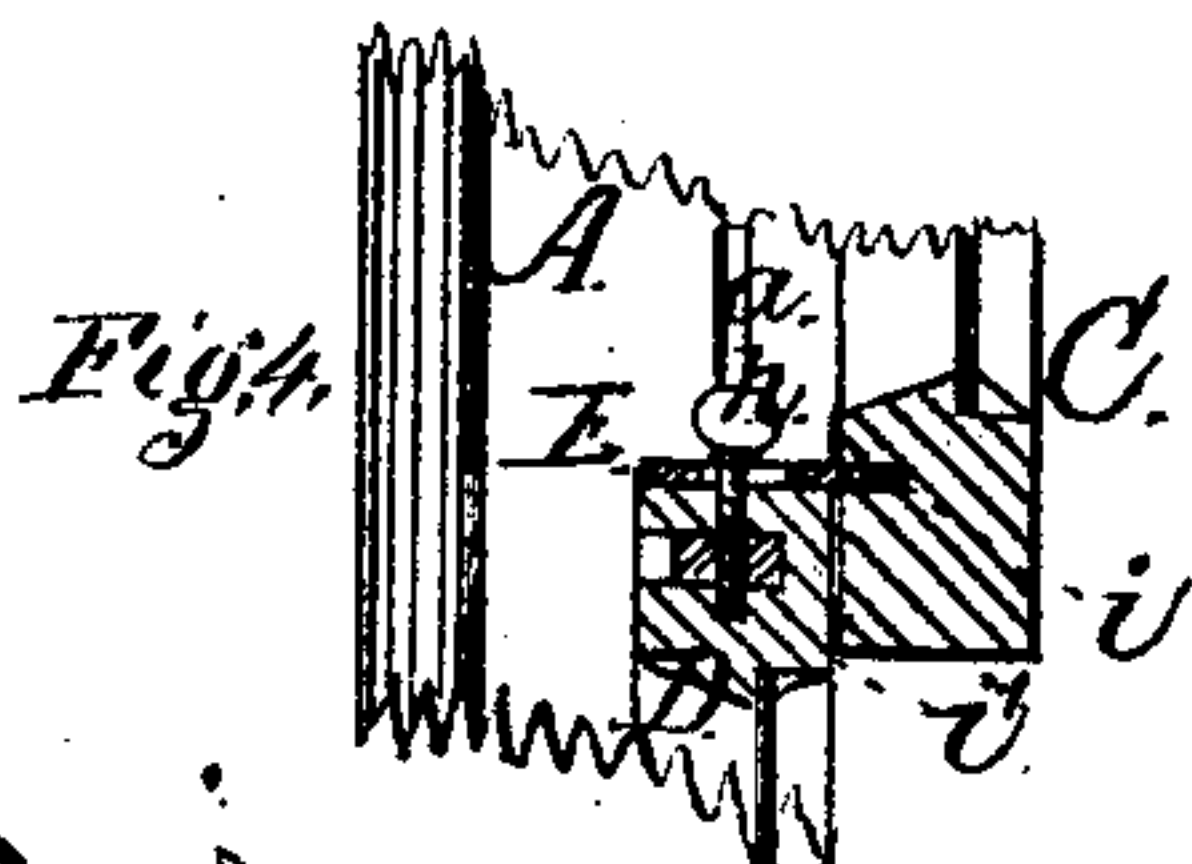
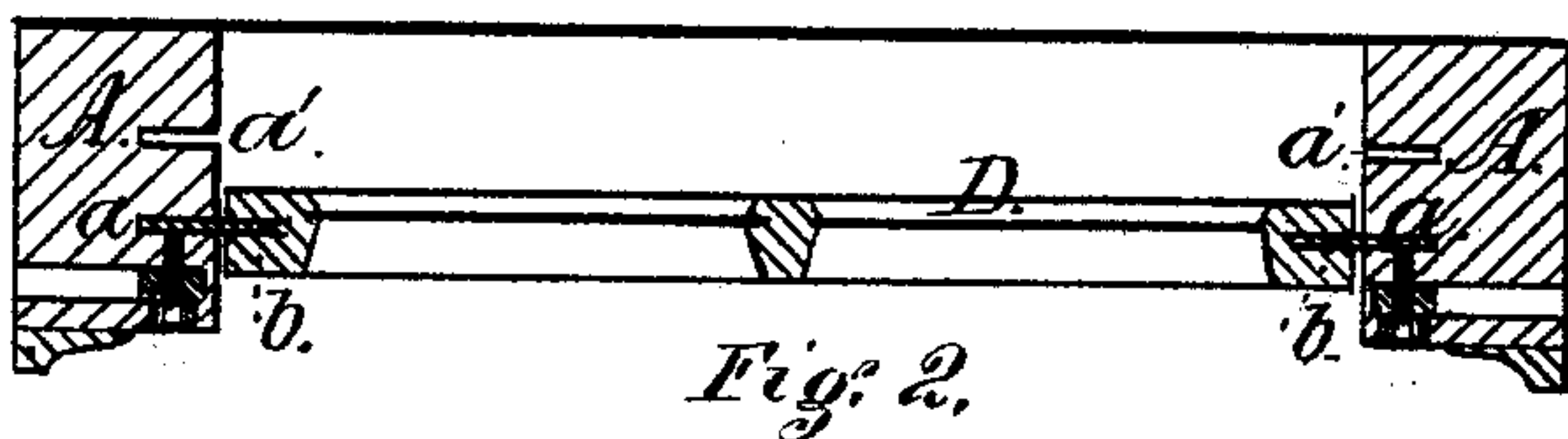
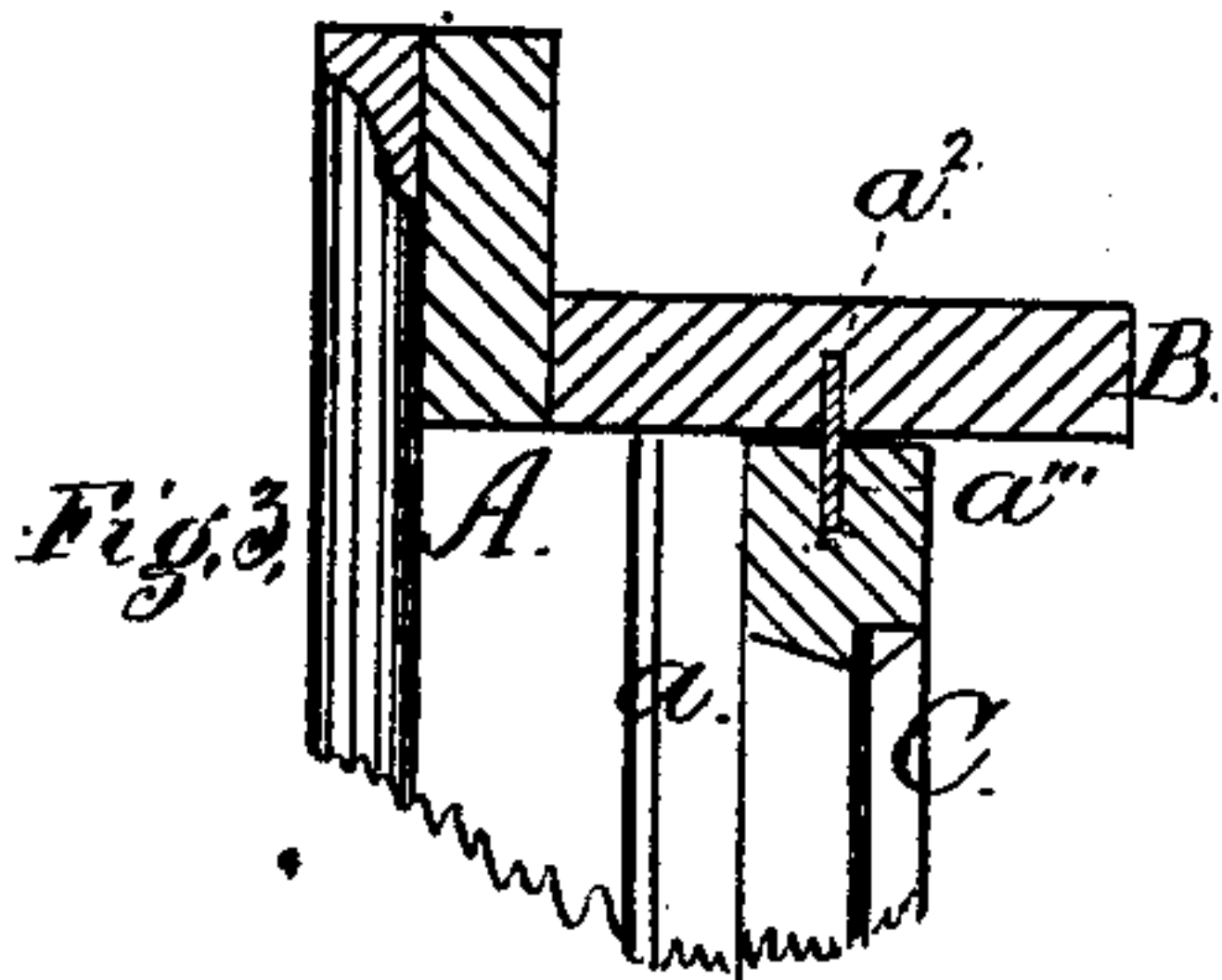
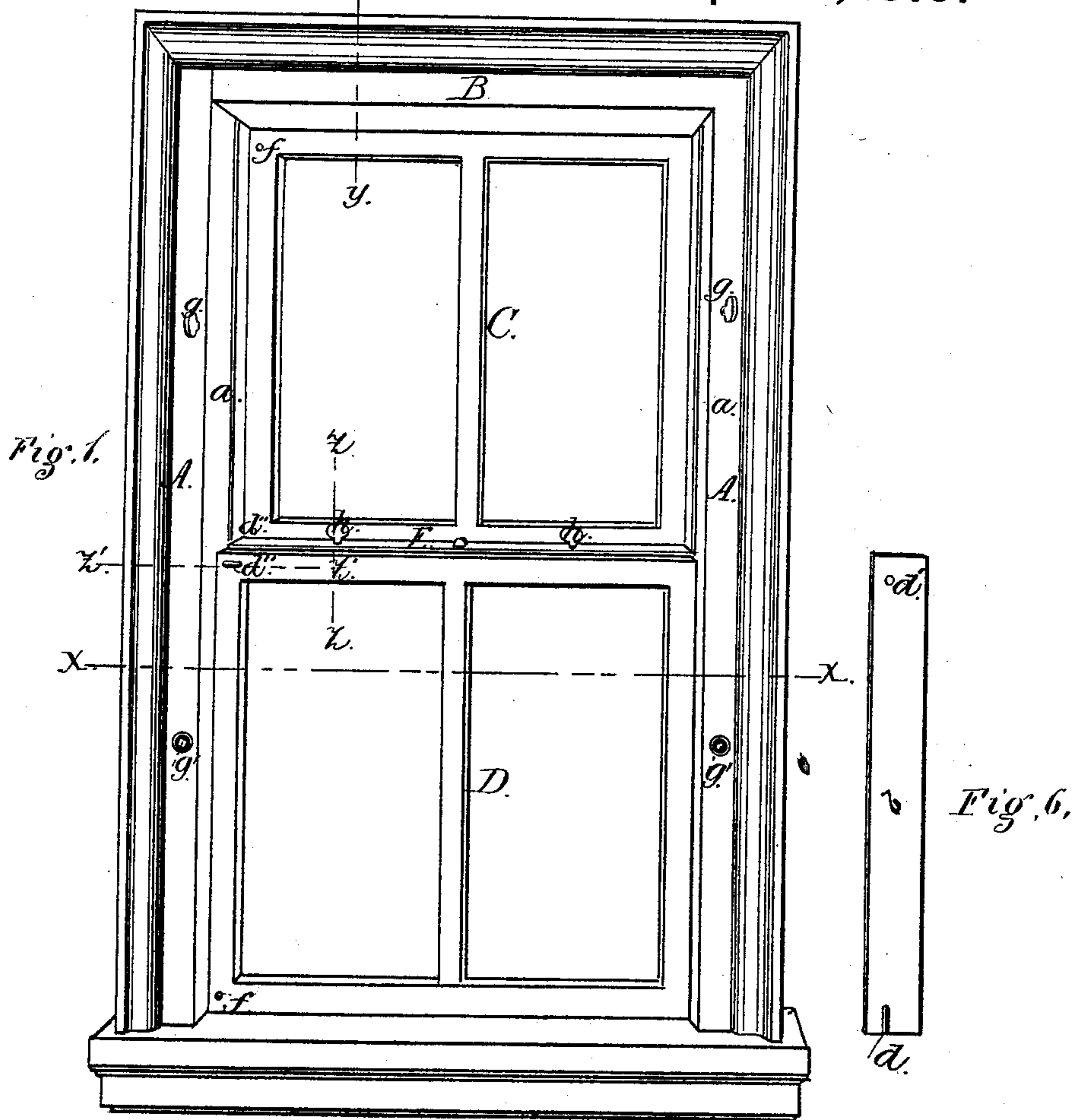


G. M. EVANS.  
Window.

No. 219,809.

Patented Sept. 23, 1879.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN WINDOWS.

Specification forming part of Letters Patent No. **219,809**, dated September 23, 1879; application filed February 11, 1878.

*To all whom it may concern:*

Be it known that I, GEORGE M. EVANS, of the city of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful inventions or Improvements in Window-Frames and Sashes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of the same.

My invention relates to devices having for their object the rendering of the window air and dust tight and the securing of the sash in any desired position without the use of springs or weights.

It consists, first, in providing the sash with metal tongues which match into corresponding grooves in the window-frame, so that by means of set-screws a tight joint can be obtained between the tongues and the sides of the grooves which will exclude the dust and air; secondly, it consists of a metal slide secured by screws over the lower sash, so arranged that when the window is closed it is used to cover the space between the two sash, and thus form an air and dust tight joint.

In the accompanying drawings, forming part of this specification, Figure 1 is a front elevation of my improved air and dust tight window. Fig. 2 is a transverse section on line *x x*. Fig. 3 is a section on line *y y*. Fig. 4 is a section on line *z z*. Fig. 5 is a section on line *z' z'*. Fig. 6 represents the metal tongue for the sides of the sash.

Similar letters of reference indicate corresponding parts in all the figures.

Referring to the drawings, A A are the sides of the window-frame, and B is the top thereof. C is the upper sash, and D is the lower. The sides A A are each provided with the parallel vertical grooves *a a'*, and the under side of the top B has a similar groove, *a''*, in line with the groove *a'*. The lower sash has on each side a metal tongue, *b*, fitted in a groove in the side of the sash, as clearly shown in Figs. 2 and 5. These tongues run the whole length of the side of the sash, and they match with the grooves *a* in the frame. The upper sash is likewise provided with metal tongues on its sides, which match with the grooves *a'*,

so that both the upper and lower sash move easily up and down, being guided and held in place by the metal tongues. The top of the upper sash is also provided with a metal tongue, *a'''*, fixed in a groove therein, which matches with the groove *a''* in the under side of the top B of the frame.

The tongue is fixed in the groove in the sash on one side, but on the other side it is adapted to be taken from the sash, in order that the sash may be removed from the frame. For this purpose the removable tongue is arranged as shown in Fig. 6—that is, the upper end of the tongue is provided with a slot, *d*, and the opposite end is provided with a hole, *d'*. The slot in the end of the tongue straddles a pin, *d''*, or other suitable device, which is passed through the side of the sash, so as to cross the groove in which the tongue is placed, as shown in Fig. 5. The opposite end is secured by a pin, *f*, passed through the side of the sash and through the hole in the tongue.

To remove the sash from the frame the pin *f* is withdrawn. The tongue then drops down or is withdrawn. This releases the sash on one side, and it can be easily removed from the frame. In the case of the lower sash it is necessary that it should be lifted before the tongue can be removed.

For tightening the sash in the frame, so as to cause the tongues to form a tight joint with the sides of the grooves, and thus exclude the air and dust, I make use of the set-screws *g g' g'*, the former for the upper sash and the latter for the lower one. These set-screws can be engaged by nuts let into the frame, through which they pass and bear, when desired, upon the side of the metal tongue.

When it is desired to make the window air and dust proof, the set-screws are screwed in against the tongues, which are thus driven against the opposite side of the groove in which they move, forming tight joints therewith, which it will be found will exclude both air and dust.

The pressure of the set-screws on the side tongues of the upper sash operates to force the tongue on the top of the sash against the side of the groove in which it runs when the sash is lifted, and these side set-screws will generally



be found sufficient; but there is no objection to using a set-screw for this tongue should it be found necessary.

The side tongues on the upper sash should be made broader than those on the lower sash, so that they will project slightly deeper into the side frames of the window. The object of this is to enable the set-screws to be set into the frame so as to avoid the grooves *a a* in which the tongues of the lower sash run, and thus enable it to bear against the tongue of the upper sash. This construction is absolutely necessary to enable the set-screws *g g* to perform their part of tightening the upper sash independently of the lower sash. Otherwise the set-screws would have to traverse the grooves *a* of the lower sash, and this would prevent the lower sash from being lifted when desired.

The advantages of a sash and window thus constructed are obvious. The metal tongues run easier than wooden ones, and do not swell, as the ordinary window does. Consequently no difficulty will be experienced in raising the sash at any time. The window can be made cheaper than the ordinary window, as no beads are required, and thus the expense of fitting is avoided. The grooves for the tongues to run in are all planed right into the side frames, and no fitting is required.

But the great merit of the invention consists in making the window absolutely air and dust tight without the use of weather-strips or other devices of that kind, which are both troublesome and expensive. The devices by which this can be done are always ready for use, and can be applied without any trouble and without any material addition to the cost of the window. Then the sash can be removed from the frame more quickly and easily than in the old style of window.

To make the window completely air and dust proof, I make use of the metal strip *E*, Figs. 1 and 4, which is placed on the top of the lower sash, and is held there by the set-screws *h h*. In the bottom of the upper sash, on a line with the top of the lower sash, is made a groove, *i*. When the window is closed, as in Fig. 1, the metal strip *E* is released by the set-screws and shoved forward, so as to occupy the groove *i* in the upper sash and cover the space *i'* between the two sash, and in this position it is secured by the set-screws. This completely excludes any air or dust that might

find its way through the space *i'* between the sash.

This device also operates as a fastener for the window, which will hold it securely against being raised from the exterior.

The set-screws *g g g' g'*, in addition to their office of tightening the window, are also useful as fasteners for securing the window against being lifted from the outside, and also to secure it in any desired position without the use of weights or springs. When the sash is lifted or lowered a simple turn of the set-screw will secure it against the possibility of falling.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a window-sash provided on its sides with metal tongues *b*, and a window-frame provided on its inner sides, facing the sash, with corresponding grooves, in which said tongues are adapted to run, and set-screws for tightening said tongues, substantially as and for the purpose herein shown and described.

2. As an improvement in windows, the tongue made of metal and provided with a slot, *d*, and pin-hole *d'*, and secured in the sash by means of the pins *d''* and *f*, whereby it can be readily taken from the sash for the purpose of allowing the sash to be removed from the window, substantially as described.

3. As an improvement in windows, the metal strip *E*, placed on the top of the lower sash and adapted to be moved forward into the groove *i* in the bottom rail of the upper sash when the window is closed, and secured therein by means of the set-screws *h h*, for the purpose of closing the space *i'* between the sash and excluding the dust and air, substantially as described.

4. As an improvement in windows, an air and dust proof window composed of the following elements: the sash *C* and *D*, provided with the metal tongues *a'''* and *b*, matching with and adapted to run in the grooves *a a' a''* in the frame, the set-screws *g g g' g'*, the metal strip *E*, and set-screws *h h*, all combined and arranged in the manner substantially as described.

GEORGE M. EVANS.

Witnesses:

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