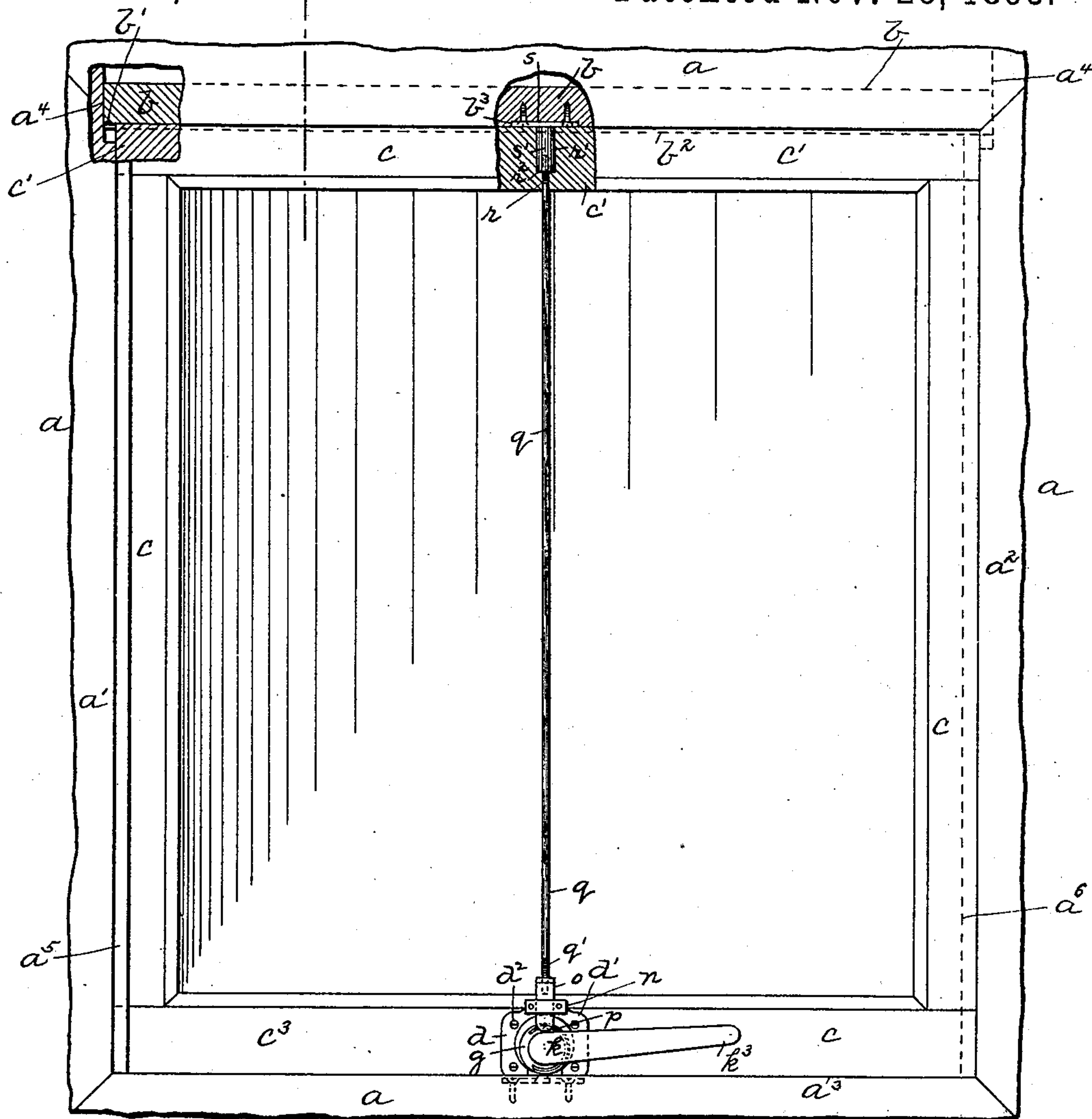


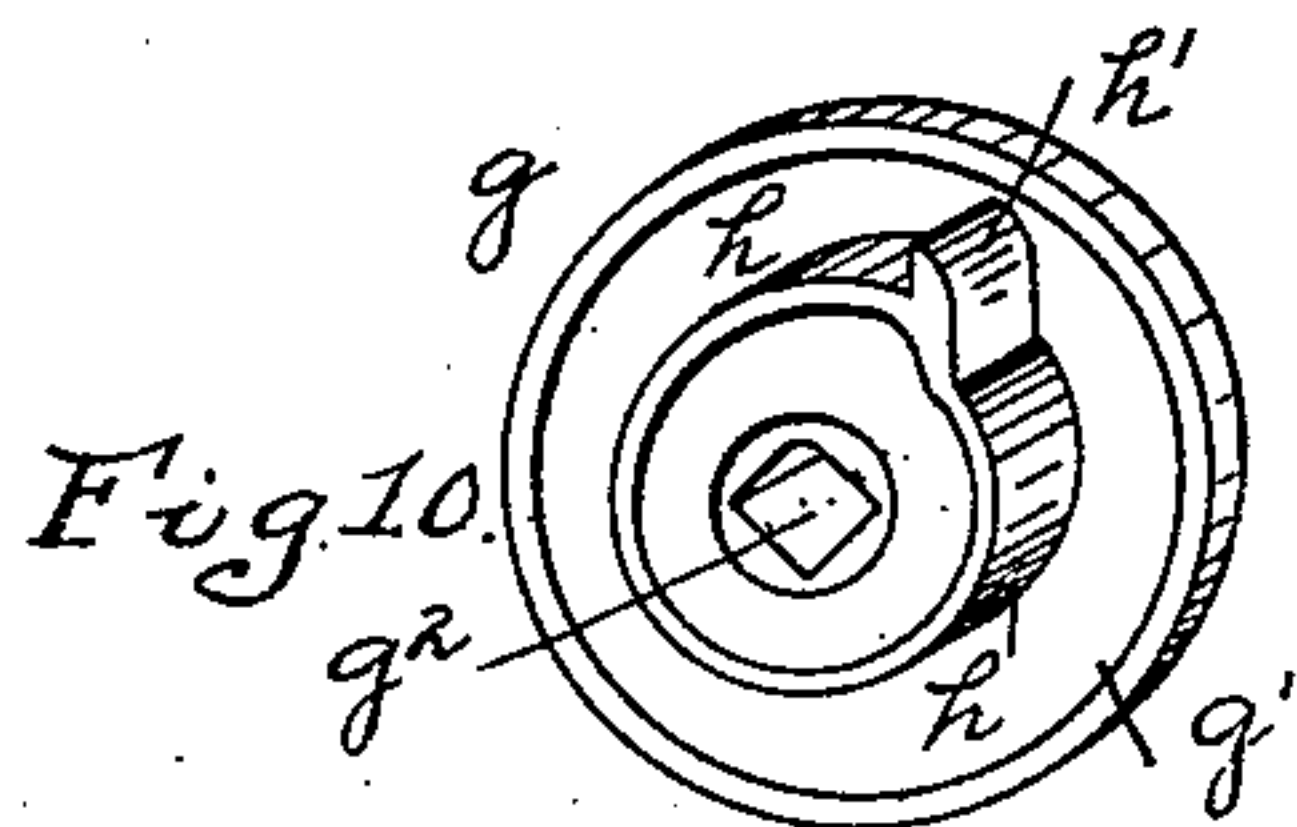
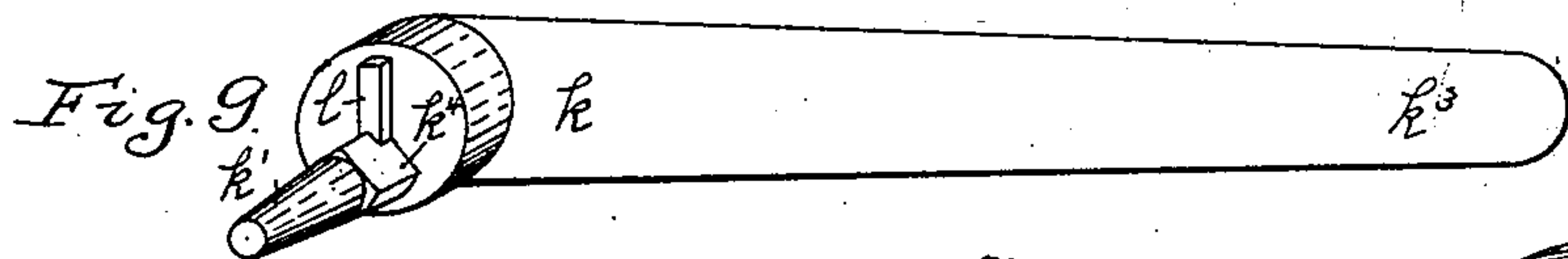
3 Sheets—Sheet 1.

No. 509,377.

Patented Nov. 28, 1893.



*Fig. 1.*



Witnesses.  
Wm. J. Martin.  
 D. L. Dorsey.

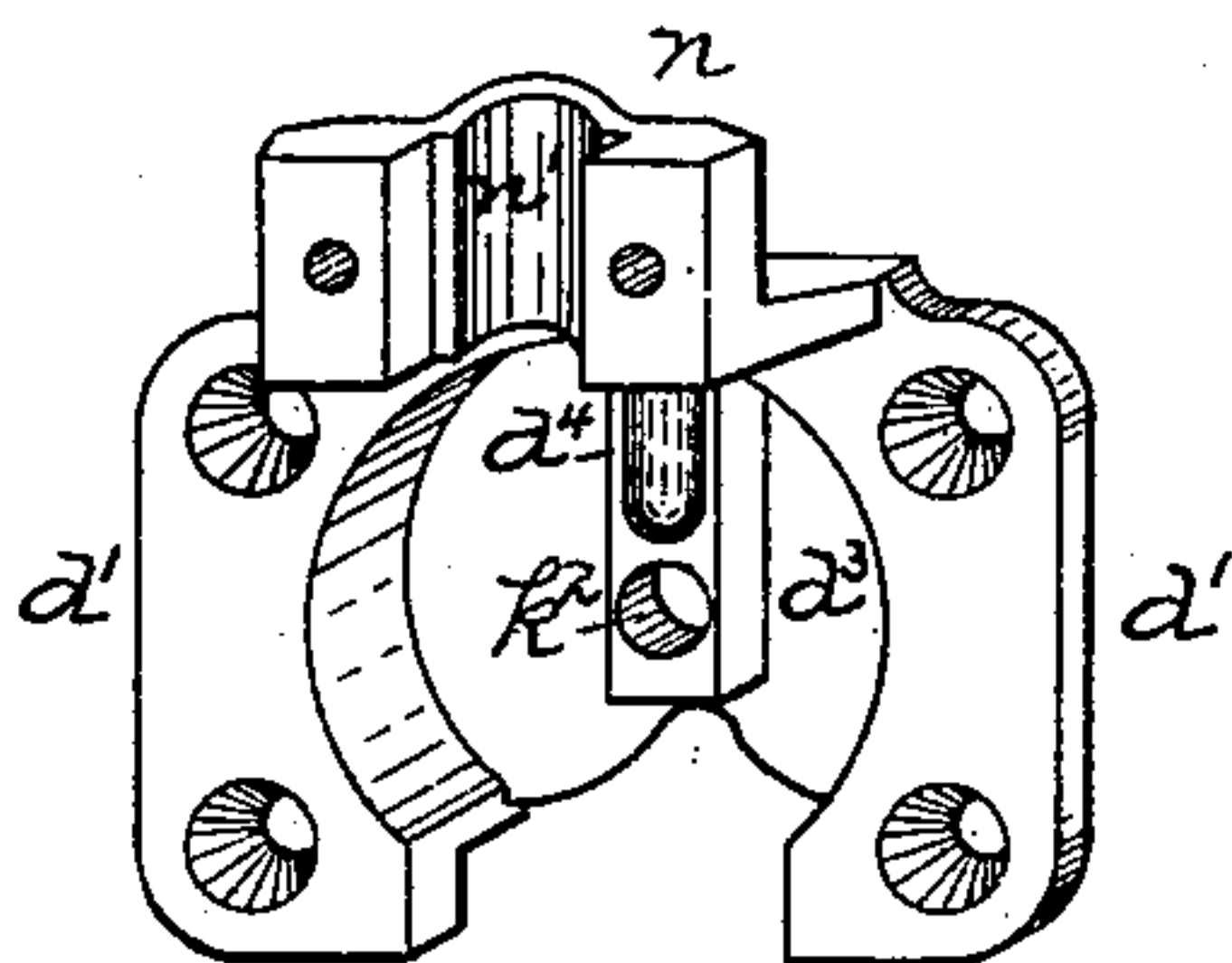


Fig. 8.

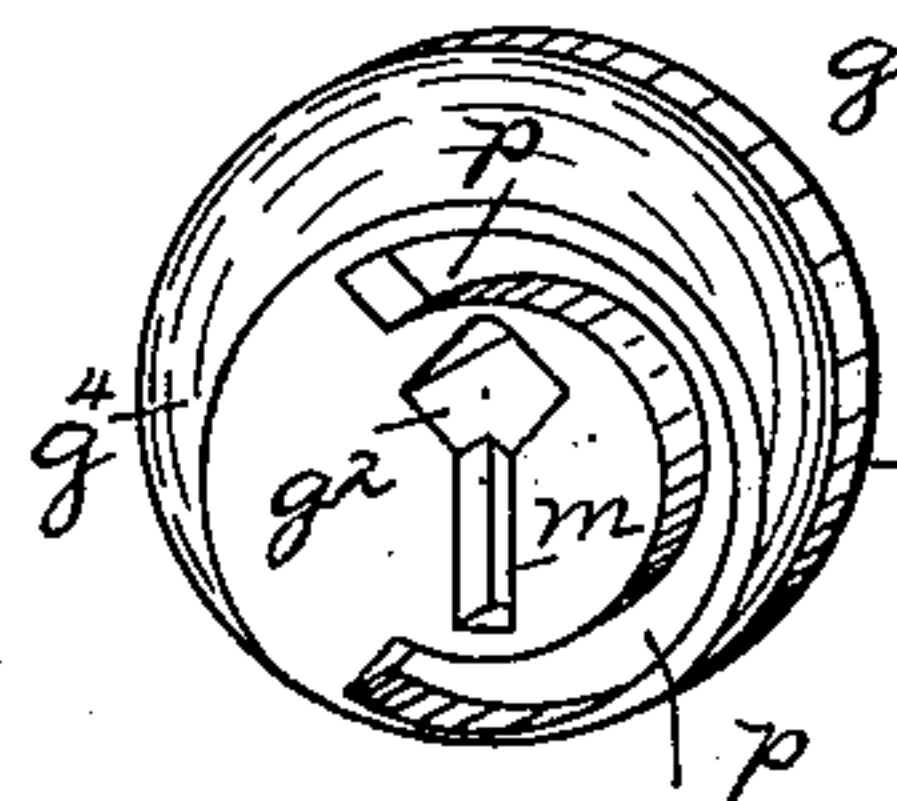


Fig. 11.

Inventor.  
David P. Hopkins.  
& Kay, Tatten & Cooley  
Attorneys.

(No Model.)

3 Sheets—Sheet 2.

D. P. HOPKINS.  
WINDOW FRAME AND SASH.

No. 509,377.

Patented Nov. 28, 1893.

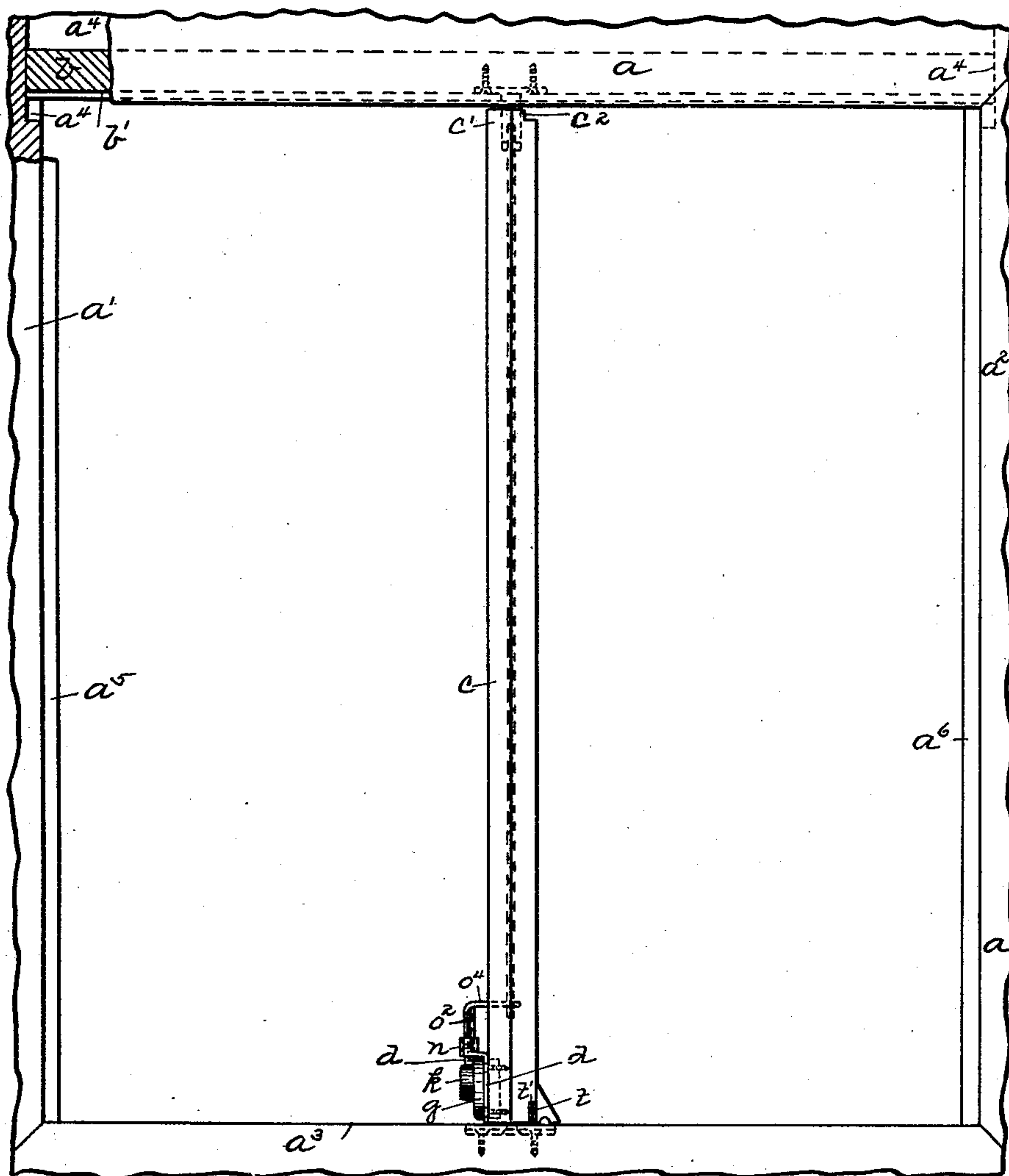


Fig. 2.

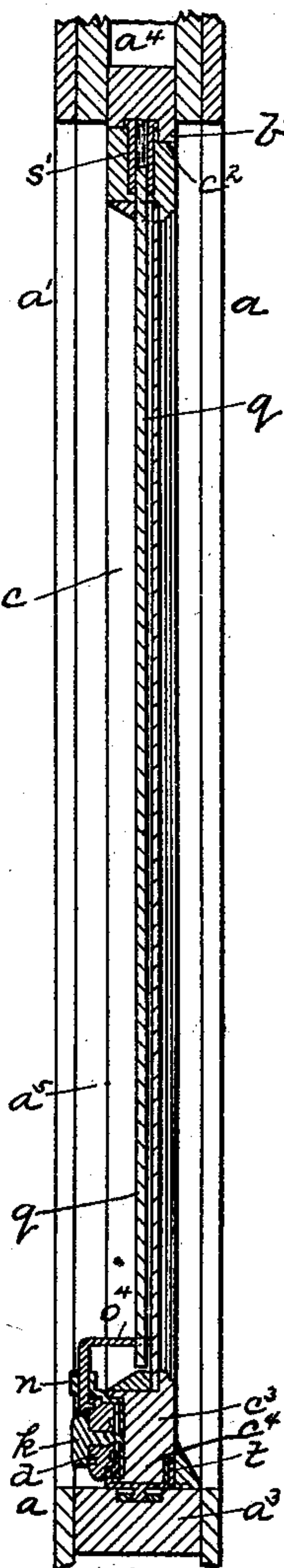


Fig. 3.

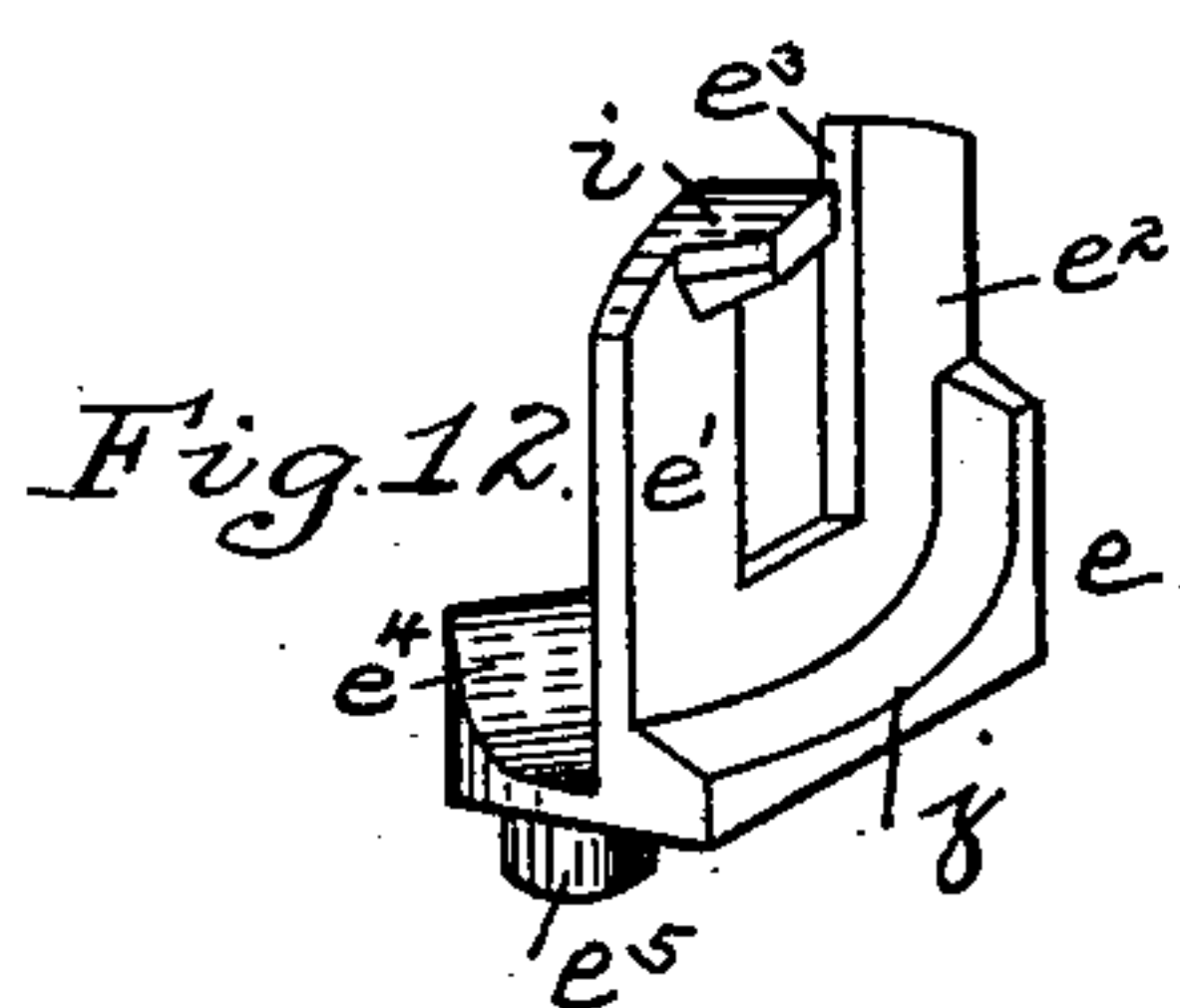


Fig. 12.

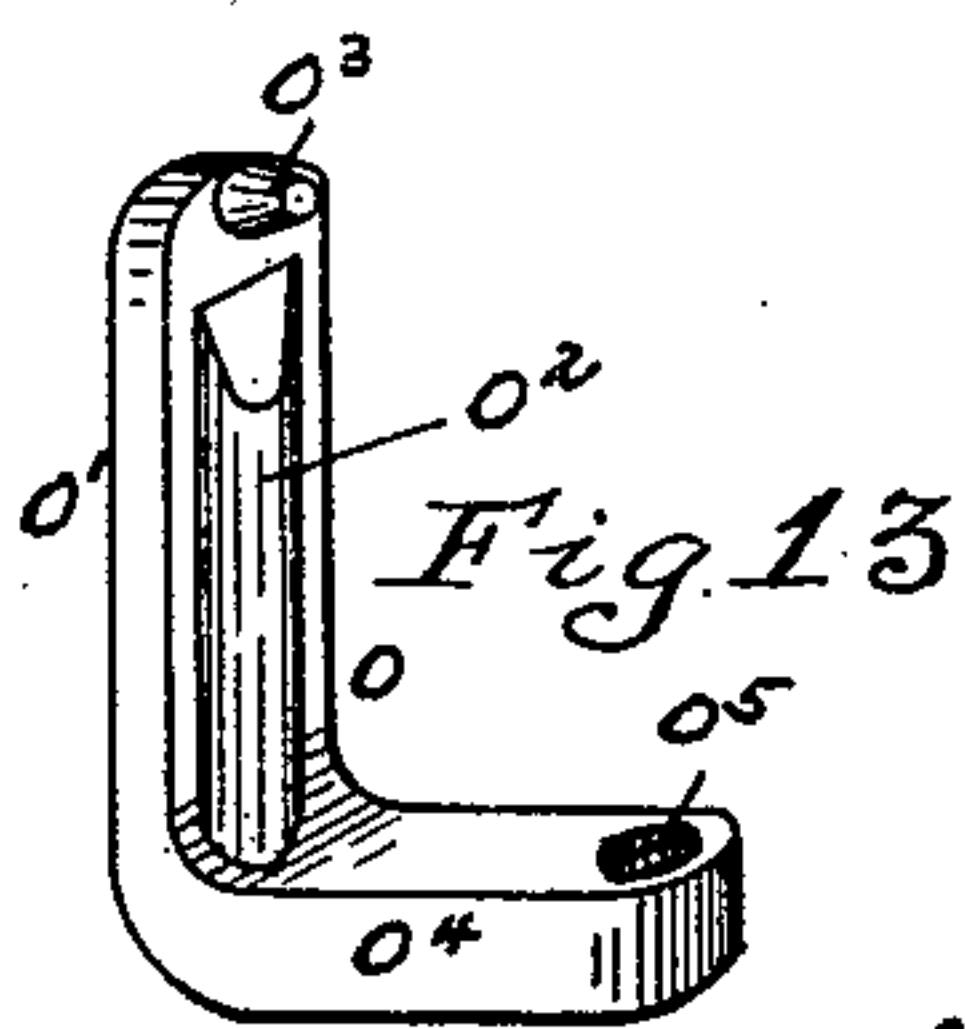


Fig. 13.

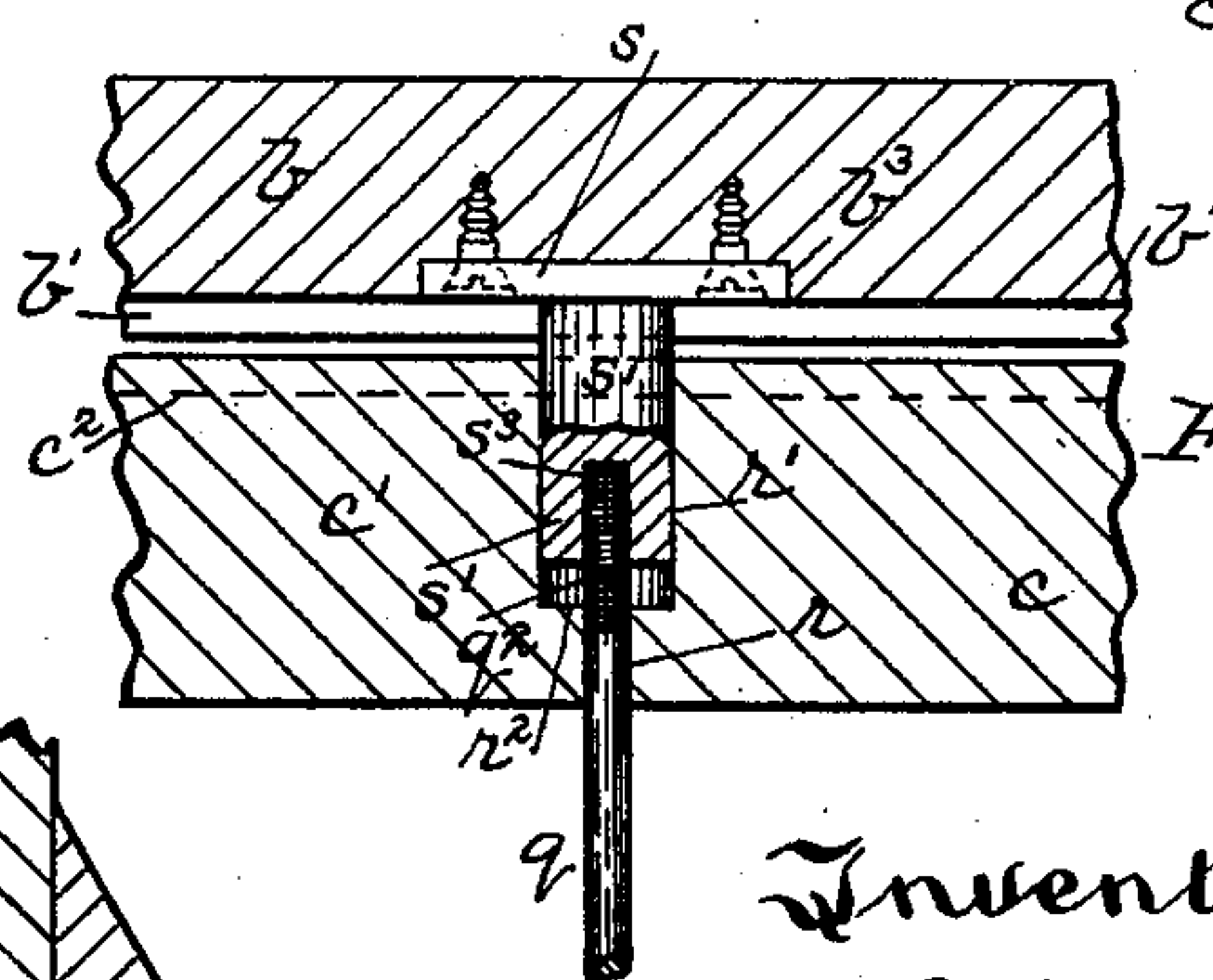


Fig. 6.

Witnesses.  
H. L. Bartlett.  
D. L. Dorsey.

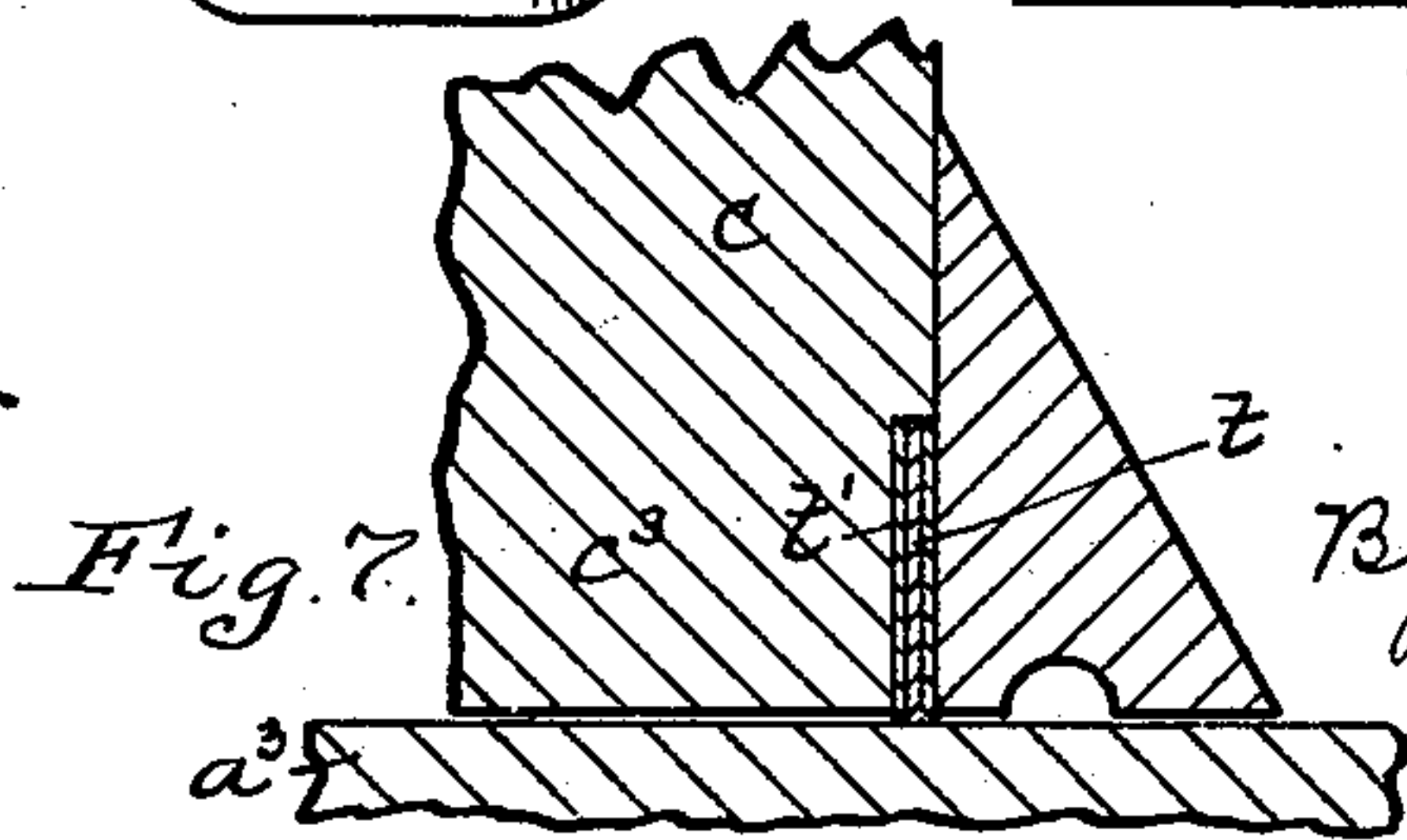


Fig. 7.

Inventor,  
David P. Hopkins.  
By Kay, Totten & Cooke  
Attorneys.



D. P. HOPKINS.  
WINDOW FRAME AND SASH.

No. 509,377.

Patented Nov. 28, 1893.

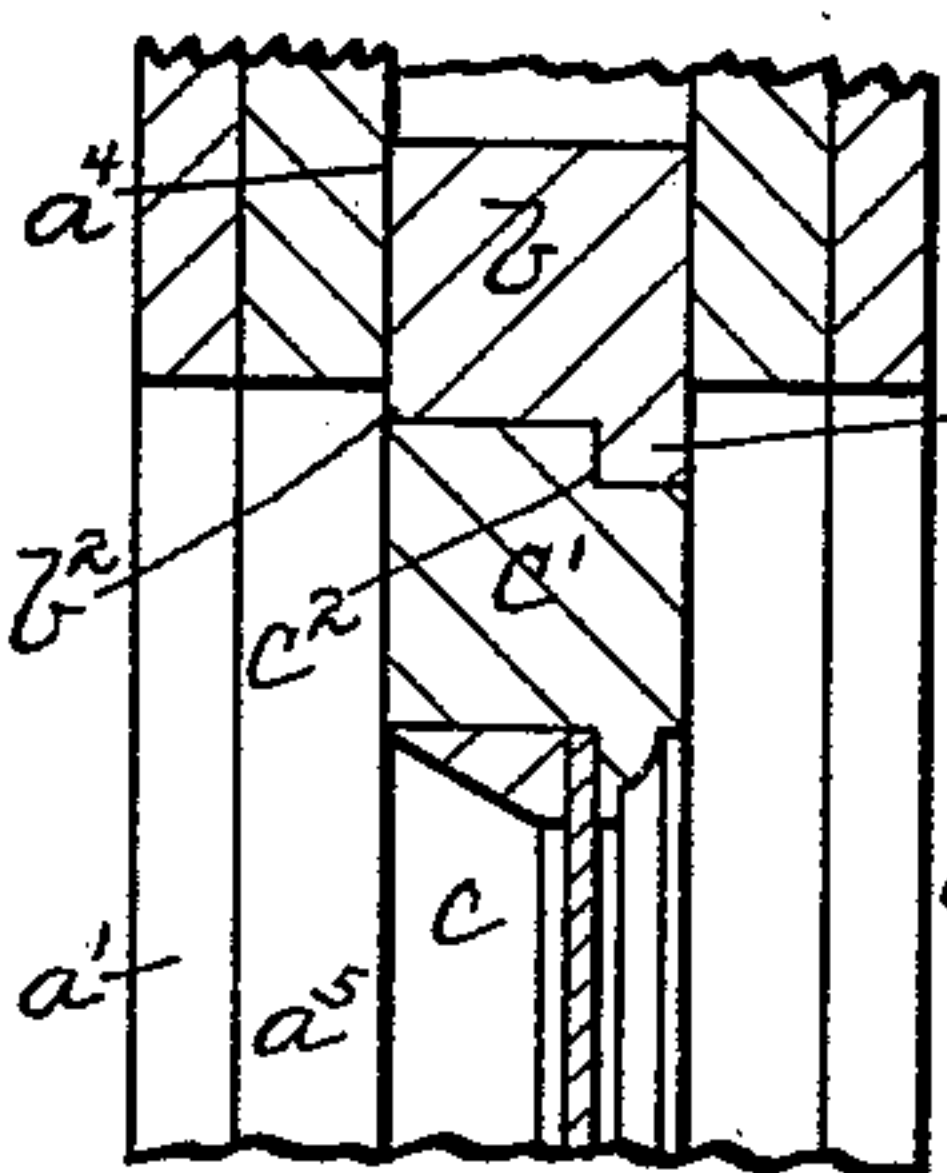
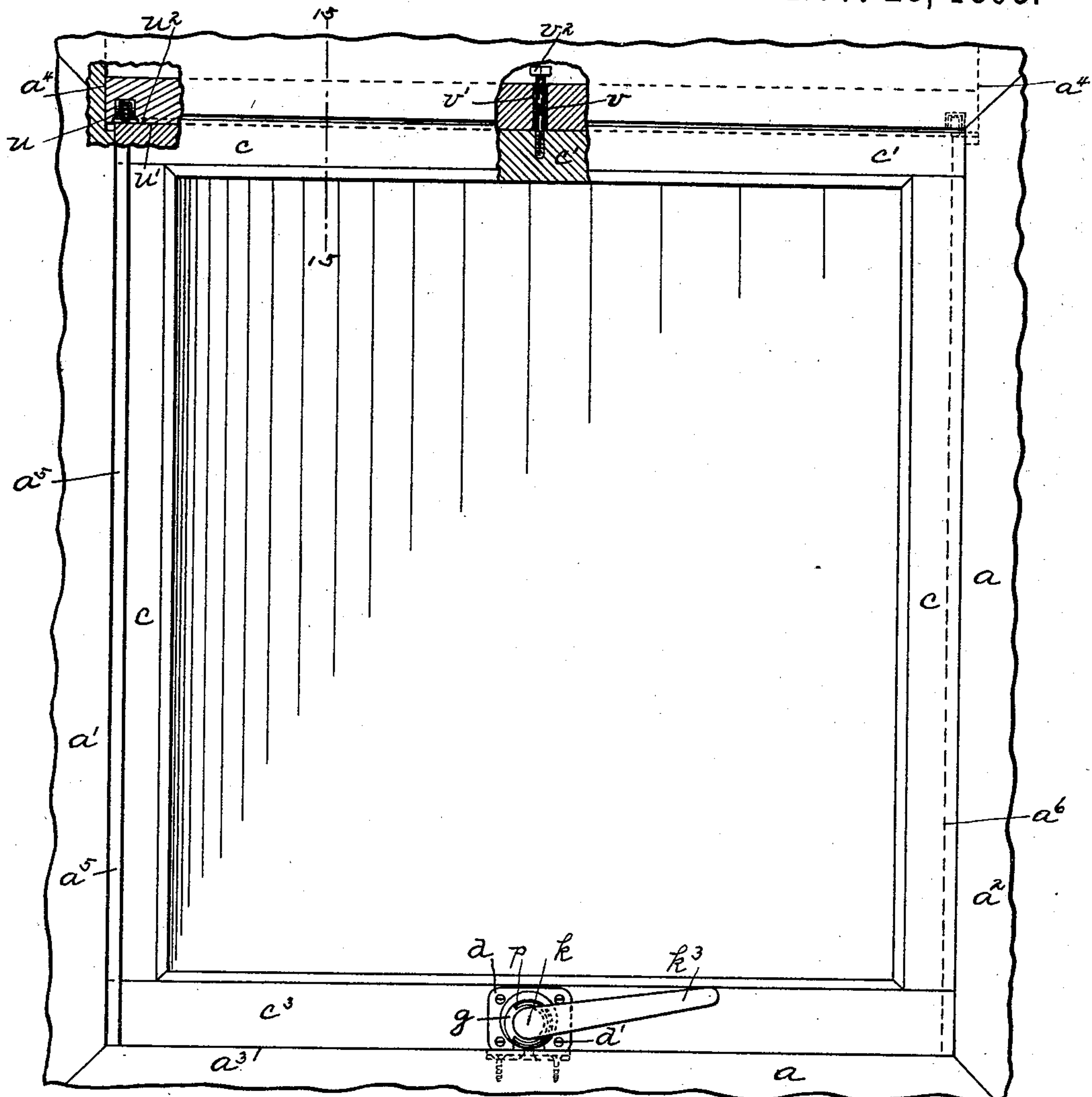


Fig. 5.

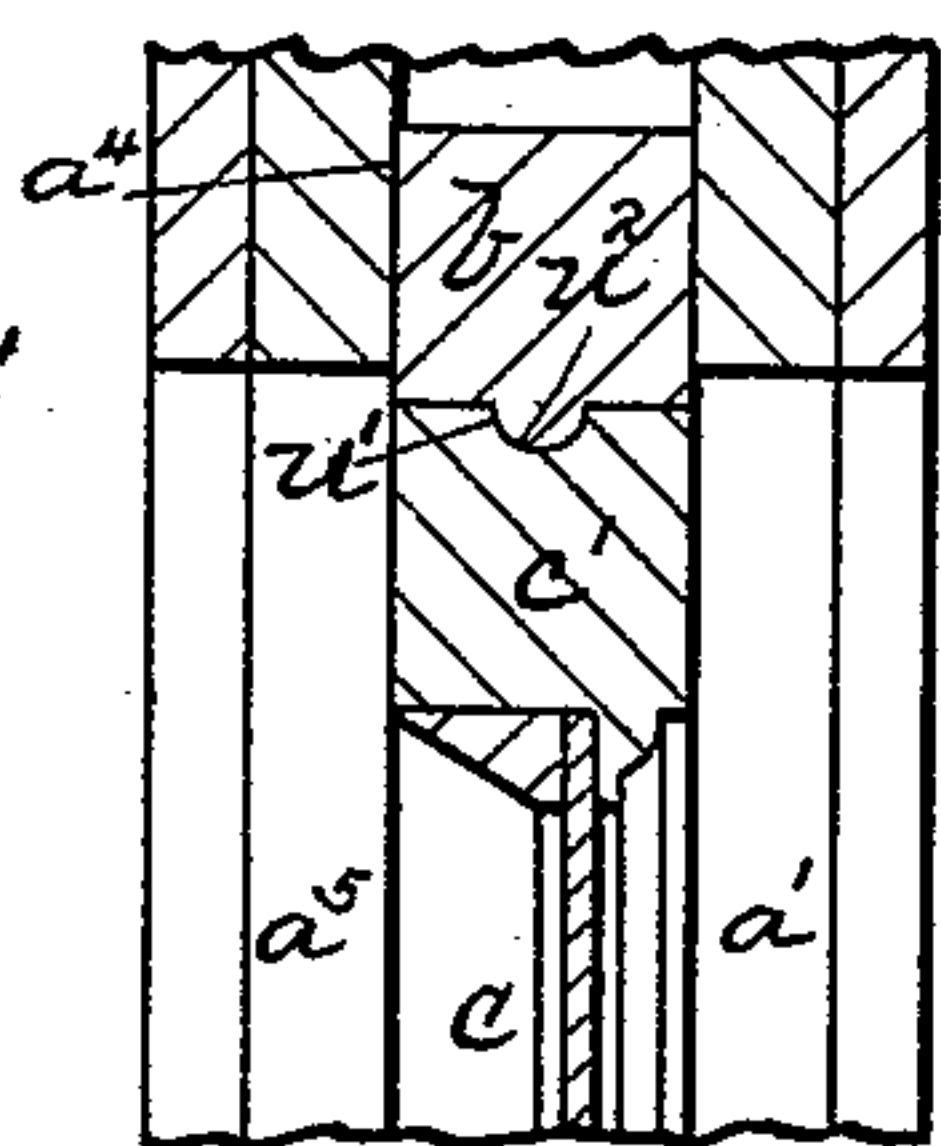


Fig. 15.

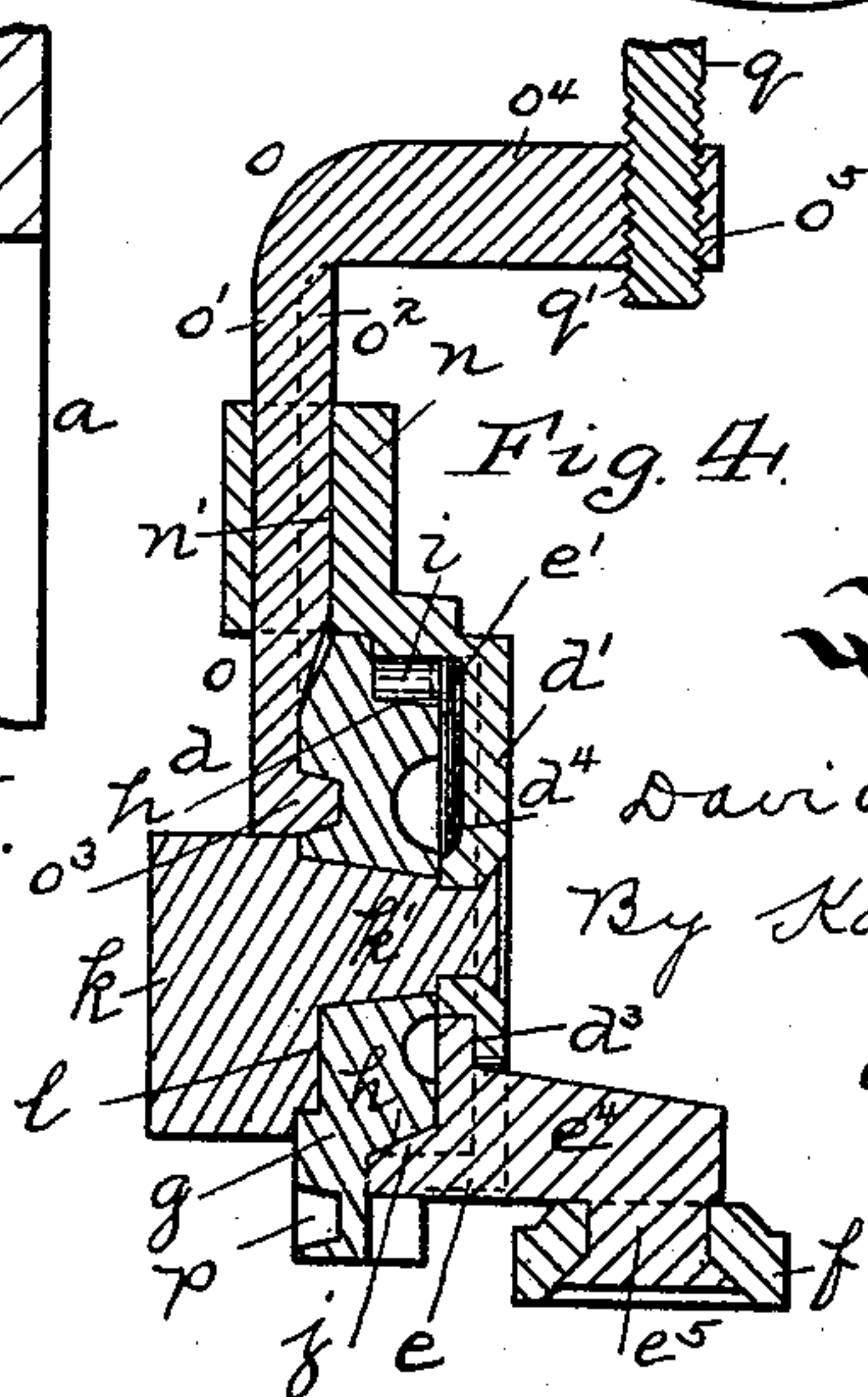


Fig. 4.

Inventor.

David P. Hopkins

By Kay, Tatten & Cooke,

attorneys.

Witnesses.  
H. J. Martin.  
D. L. Dorsey.



# UNITED STATES PATENT OFFICE.

DAVID P. HOPKINS, OF ALLEGHENY, PENNSYLVANIA.

## WINDOW FRAME AND SASH.

SPECIFICATION forming part of Letters Patent No. 509,377, dated November 28, 1893.

Application filed April 7, 1893. Serial No. 469,423. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID P. HOPKINS, a resident of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Window Frames and Sashes; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to window frames and sashes, and has special reference to the particular kind of window frames in which the sash is pivoted so as to rotate in the frame in order to open or close the window as desired. Heretofore in the use of these window frames and sashes, the great difficulty was that the sash was generally smaller than the frame space, and had a follower resting loosely on its top which worked through the frame and closed the opening between the frame and sash causing a non weather-tight joint which allowed dust, rain and wind to enter the apartment. Another difficulty was that when the sash was raised above the sill by means of a raiser or clamp at its bottom, in order to turn or rotate the same, the operator was required to exercise great strength on account of the window and follower being heavy, these particular devices being generally used only on large windows, which were cumbersome and difficult to handle in cleaning the outside surface of the glass.

The object of my invention is to overcome these difficulties, and to provide a window frame and sash, which, when the sash is closed, forms a practically weather-tight joint, excluding all liability of rain, dirt and wind entering the apartment.

Another object of my invention is to provide a window frame and sash in which the sash is practically the same size as the frame space, and which can be turned without having to raise the sash, so that the window can be opened when desired and permit the cleaning out of the outside surface of the window or the entrance of air into the apartment, as desired.

To these ends my invention consists, broadly, in a window frame having a follower moving in guides therein, a sash within said frame, said sash being of the same size as the frame space and being pivoted at its top to the follower and at its bottom to the frame.

It further consists in a window frame having a sash therein pivoted at its top and bottom, said sash being of the same size as the frame space and adapted to be clamped to the sill of the window frame.

It also consists in certain other details of construction and combination of parts, all of which will be more fully hereinafter set forth and claimed.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a side view, partly in section, of a window frame and sash showing my invention applied thereto. Fig. 2 is a like view showing the sash rotated or turned in the window frame. Fig. 3 is a vertical central section through the window frame and sash. Fig. 4 is an enlarged sectional view showing the clamp for engaging with the sill and sash. Figs. 5, 6 and 7 are detail sectional views of the window frame and sash. Fig. 8 is a perspective view of the clamp case. Fig. 9 is a perspective view of the lever for operating the clamp. Figs. 10, 11, 12 and 13 are detail perspective views of different parts of the clamp. Fig. 14 is a view showing another form of my invention; and Fig. 15 is a detail section on the line 15—15, Fig. 14.

Like letters of reference herein indicate like parts in each of the figures of the drawings.

My improved window frame and sash are illustrated in their preferred form in Fig. 1, the window frame being shown at  $a$ , and having the vertical portions  $a'$   $a^2$  and the sill  $a^3$ . On the left side in front of the window is the vertical weather strip  $a^5$ , and on the opposite side back of the window is another weather strip  $a^6$ . Moving in guides  $a^4$  in the window frame  $a$  is the follower  $b$  which rests upon the top  $c'$  of the sash  $c$  and acts to close the opening made between the sash  $c$  and the window frame. The lower face  $b^2$  of the follower  $b$  engages with the top  $c'$  of the sash  $c$  by means of a rabbet or tongue  $b'$  which fits within a seat or groove  $c^2$  formed in the sash  $c$  and acts to form a tight joint.

The sash  $c$  fits neatly within the window frame and is formed of the same size as the frame space within the window frame  $a$ , being pivoted at its top to the follower  $b$  and at



its bottom to the sill  $a^3$  in the manner hereinafter described. Secured to the bottom  $c^3$  of the sash  $c$  in any suitable manner is the clamp  $d$ , which acts to clamp the sash  $c$  down onto the sill  $a^3$ , when the window is closed, and to raise the follower  $b$  when the said clamp  $d$  is freed from the sill  $a^3$ , so enabling the sash  $c$  to be turned. The clamp  $d$  is formed of the case  $d'$ , which is attached to the bottom  $c^3$  of the sash  $c$  by the screws  $d^2$  and has formed in it the seat  $d^3$  for the reception of the bearing piece  $e$ , this bearing piece  $e$  having the vertical guide arms  $e'$   $e^2$  which move on each side of the guide  $d^4$  in the seat  $d^3$  of the clamp, the guide  $d^4$  fitting within an opening  $e^3$  between the vertical guide arms  $e'$   $e^2$  of the bearing piece. Projecting from said bearing piece  $e$  is the horizontal portion  $e^4$  which fits within the bottom  $c^3$  of the sash  $c$  and carries the pivot pin  $e^5$ , said pin  $e^5$  fitting within the plate  $f$  attached to the sill  $a^3$  of the window frame and forming the lower pivot of the swinging sash  $c$ . Fitting up against the case  $d'$  is the revolving plate  $g$ , which has on its interior face  $g'$  the cam or eccentric  $h$ , said cam or eccentric  $h$  having the stop  $h'$  which engages with a lug or pin  $i$  on the vertical guide arm  $e'$  of the bearing piece  $e$ , and the face of said cam or eccentric  $h$  bearing on the projecting face  $j$  on the bearing piece  $e$ . In order to operate said clamp  $d$ , a lever  $k$  is provided, which has the journal pin  $k'$  extending out eccentrically from the inner face thereof, and passing through the revolving plate  $g$  enters an opening  $k^2$  in the case  $d$  and is journaled and riveted thereto, the said lever  $k$  being provided with a handle  $k^3$  for convenience in operating. The journal pin  $k'$  is mounted eccentrically on the lever  $k$  and has a square portion  $k^4$  thereon which fits within a square seat  $g^2$  in the revolving plate  $g$ , and the said lever  $k$  is further provided with a lug  $l$  which fits within a seat  $m$  in the revolving plate  $g$  which assists in revolving the plate  $g$  when the lever  $k$  is turned. Extending out from the top of the case  $d'$  of the clamp  $d$  is the guide  $n$  which has a guideway  $n'$  therein, through which the lifting bar  $o$  passes, the said lifting bar  $o$  being provided with a guide  $o^2$  on its vertical portion  $o'$  which fits within the guide-way  $n'$  of the guide  $n$ . At the lower end of the vertical portion  $o'$  of the lifting bar  $o$  is a lug  $o^3$  which fits and travels within a cam or eccentric seat  $p$  on the exterior face  $g^4$  of the revolving plate  $g$  and operated by the lever  $k$  which has its journal pins  $k'$  mounted off the center so as not to interfere and enable the cam or eccentric seat  $p$  to perform its work in engaging with the lug  $o^3$  on the lifting bar  $o$ . The lifting bar  $o$  has the horizontal portion  $o^4$  projecting out therefrom provided with a threaded opening  $o^5$  within which the rod  $q$  by its threaded end  $q'$  engages. The rod  $q$  extends up in front of the sash  $c$  and passes through an opening  $r$  in the top  $c'$  of the sash  $c$ . On the lower face  $b^2$

of the follower  $b$  there is provided the plate  $s$  which fits within the seat  $b^3$  in the follower  $b$ , said plate  $s$  having the extension  $s'$  formed thereon which extends down into the enlarged portion  $r'$  of the opening  $r$  in the top  $c'$  of the sash  $c$  and forms the upper pivot of the sash. The rod  $q$  engages by the threaded upper end  $q^2$  with the threaded slot  $s^3$  in the extension  $s'$  of the plate  $s$  and acts to raise the follower  $b$  when desired. In the closed position of the sash  $c$  the extension or pivot  $s'$  of the plate  $s$  in the follower  $b$  rests against the head  $r^2$  in the top  $c'$  of the sash.

For the purpose of excluding all liability of wind, rain or dust entering the apartment when the window is closed, there is provided on the lower face  $c^4$  of the sash  $c$  a rubber or like flexible strip  $t$ , said flexible strip  $t$  entering a seat  $t'$  in the bottom  $c^3$  of the sash, and extending down a short distance so as to contact with the sill  $a^3$  of the window frame, as is fully shown in Fig. 7.

The operation of my improved window frame and sash will now be described. As is shown in Fig. 1, the sash is in its closed position, with its lower face  $b^2$  clamped down against the sill  $a^3$  of the window frame, and the lever  $k$  being turned to the right side of the clamp  $d$ . To assume this position of the lever  $k$  allows the turning of the revolving plate  $g$  which causes the cam or eccentric  $h$  to travel over the projecting face  $j$  on the bearing piece  $e$  until the cam or eccentric  $h$  reaches the point nearest the center of the journal pin  $k'$ , so lowering the bearing piece  $e$  and the sash slightly and clamping the sash  $c$  down onto the sill  $a^3$  of the window frame  $a$  which compresses the flexible strip  $t$  against the sill  $a^3$  and forms a weather-tight joint at the bottom of the window. At the same time as the revolving plate  $g$  is turned to the right, the cam or eccentric seat  $p$  on the revolving plate  $g$  is turned until the lug  $o^3$  on the lifting bar  $o$  reaches the point nearest the center of the journal pin  $k'$  on the lever  $k$ , so lowering said lifting bar  $o$  and the rod  $q$  allowing the extension  $s'$  on the plate  $s$  to seat itself in the opening  $r'$  and pull the follower  $b$  down onto the top  $c'$  of the sash  $c$ , the rabbet  $b'$  fitting within the groove  $c^2$  in the sash  $c$  and forming a weather-tight joint at the top of the window. In order to unclamp the sash from the sill  $a^3$  of the window frame  $a$  so as to permit the swinging of the sash  $c$  in the frame  $a$ , the operator grasps the handle  $k^3$  of the lever  $k$  and turns it to the left which causes the turning of the revolving plate  $g$ , the cam or eccentric  $h$  traveling around on the projection  $j$  of the bearing piece  $e$  until the cam or eccentric  $h$  reaches the point remotest from the center of the journal pin  $k'$  of the lever  $k$ , so forcing down the bearing piece  $e$  and raising the sash  $c$  upon its pivot pin  $e^5$  in the sill  $a^3$  of the window frame. At the same time the revolving plate  $g$  is turned to the right, the lug  $o^3$  on the lifting bar  $o$  is traveling in the cam or eccentric seat  $p$  and when the



revolving plate *g* is turned sufficiently so that the cam or eccentric seat *p* reaches a point remotest from the journal pin *k'* on the lever *k*, the lug *o*<sup>3</sup> will reach its highest point and raise the rod *q* through the medium of the lifting bar *o*, so raising the follower *b* from engagement with the top *c'* of the sash *c* by means of the rod *q* being connected to the extension or pivot *s'* attached to the follower *b* as is fully shown in Fig. 5. After the turning of the lever *k* to the left as above described, the sash is ready for swinging or rotating, the said sash *c* turning upon the pivot pin *e*<sup>5</sup> of the bearing piece *e* attached to the sill *a*<sup>3</sup> of the window frame, and the follower *b* being separated from the top *c'* of the sash allows the sash *c* to swing upon the extension or pivot *s'* which is still resting in the opening *r* at the top of the sash, thus enabling the operator to swing or rotate the sash *c* upon the pivot pin *e*<sup>5</sup> at the bottom and the extension or pivot *s'* at the top of the window frame.

In Fig. 14 I have shown another form of device in which the rod *q* can be dispensed with, the follower *b* sliding loosely in guides in the window frame, and having rollers or wheels *u* mounted therein which fit within the rounded seat *u'* in the sash formed for the rabbet or projection *u*<sup>2</sup> in the follower. The sash is pivoted at the top by means of the bolt *v* screwing into the sash through an opening *v'* in the follower and having a head *v*<sup>2</sup> to limit the movement of the follower when raised. After the clamp *d* has been released by the turning of the lever *k* to the left, the sash can be turned upon the pivot pin *e*<sup>5</sup> at the bottom of the window frame and the bolt *v* in the follower, the rollers or wheels *u* turning in the seat *u'* by friction exerted in opening the sash which frees the follower and forces it up and freeing the rabbet or projection *u*<sup>2</sup> from engagement with the seat *u* in the sash. After the sash has been swung on its pivots, it can be locked in any position by turning the lever *k* back to its closed position which clamps the sash *c* down onto the window frame.

It will be seen that my improved window frame and sash are easily operated and can be clamped down on the window sill tightly, which makes a weather-tight joint, all liability of wind, dust or rain entering the apartment being overcome. The sash fits neatly within the frame space of the window frame, and the follower fitting in the top of the sash by a tongue and groove joint prevents the entrance of air, wind, rain or dust at that point. The clamp is simple in construction and can be operated without any great strength, it not requiring the lifting of the window sash from a seat in the window sill, which is common to this class of windows. It does not mar the appearance of the sash, sill or window frame and the parts are all strong and not liable to get out of order.

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

1. The combination with a window frame of a follower moving therein, a sash within said frame, said sash being pivoted at one end to the follower, and at the other end to the frame, substantially as and for the purposes set forth.

2. The combination with a window frame, of a follower moving in guides in said frame, and a sash within said frame pivoted at one end thereof to the follower and at the other end thereof to the frame, said follower engaging with one end of the sash by a rabbeted joint, substantially as and for the purposes set forth.

3. The combination with a window frame, of a follower moving in guides therein, a sash within said frame, said sash being pivoted at one end thereof to the follower and at the other end thereof to the frame, and a clamp to clamp the sash to one of said ends of the frame, substantially as and for the purposes set forth.

4. The combination with a window frame, of a sash mounted within said frame, a follower moving in guides in said frame, said sash being pivoted at one end thereof to the follower and at the other end thereof to the frame, and a clamp to clamp the sash to one end of the frame, said clamp forming one of the pivots of the sash and adapted to draw down the follower onto the sash, substantially as and for the purposes set forth.

5. The combination with a window frame, of a sash mounted within said frame, a follower moving in guides in said frame, said sash being pivoted at one end thereof to the follower and at the other end to the frame, a clamp to clamp the sash to one end of the frame, said clamp forming one of the pivots upon which one end of said sash swings, and having a rod engaging with said clamp and passing through the opposite end of said sash and connected to the follower to form the other pivot, substantially as and for the purposes set forth.

6. The combination with a window frame, of a sash mounted within said frame, a clamp to clamp the sash to one end of the frame, said clamp having a box or case, and a bearing piece moving within said box or case and engaging with the window frame by a pivot thereon, substantially as and for the purposes set forth.

7. The combination with a window frame, of a sash mounted within said frame, a clamp to clamp the sash to one end of the frame, said clamp having a box or case, a bearing piece moving within said box or case and engaging with the window frame by a pivot thereon, and a revolving plate on the front of said box or case carrying a cam or eccentric engaging with the bearing piece to clamp the sash to the frame, substantially as and for the purposes set forth.

8. The combination with a window frame, of a sash mounted within said frame, a box or case, a revolving plate on the front of said



box or case having a cam or eccentric groove  
in the same, and a lifting bar engaging with  
said cam groove in the revolving plate and  
connected to the follower, substantially as  
5 and for the purposes set forth.

9. The combination with a window frame,  
of a sash mounted within said frame, a fol-  
lower moving in guides in said frame, said  
sash being pivoted at one end thereof to the  
10 follower and at the other end to the frame,  
a box or case, a revolving plate on the front  
of said box or case having a cam or eccentric

groove, a lifting bar engaging with said cam  
groove, and a rod connected to said lifting  
bar and forming the pivot for one end of the 15  
sash, substantially as and for the purposes  
set forth.

In testimony whereof I, the said DAVID P.  
HOPKINS, have hereunto set my hand.

DAVID P. HOPKINS.

Witnesses:

J. N. COOKE,  
ROBT. D TOTTEN.