

No. 667,745.

Patented Feb. 12, 1901.

C. D. TABOR.
WINDOW SASH.

(Application filed Oct. 31, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

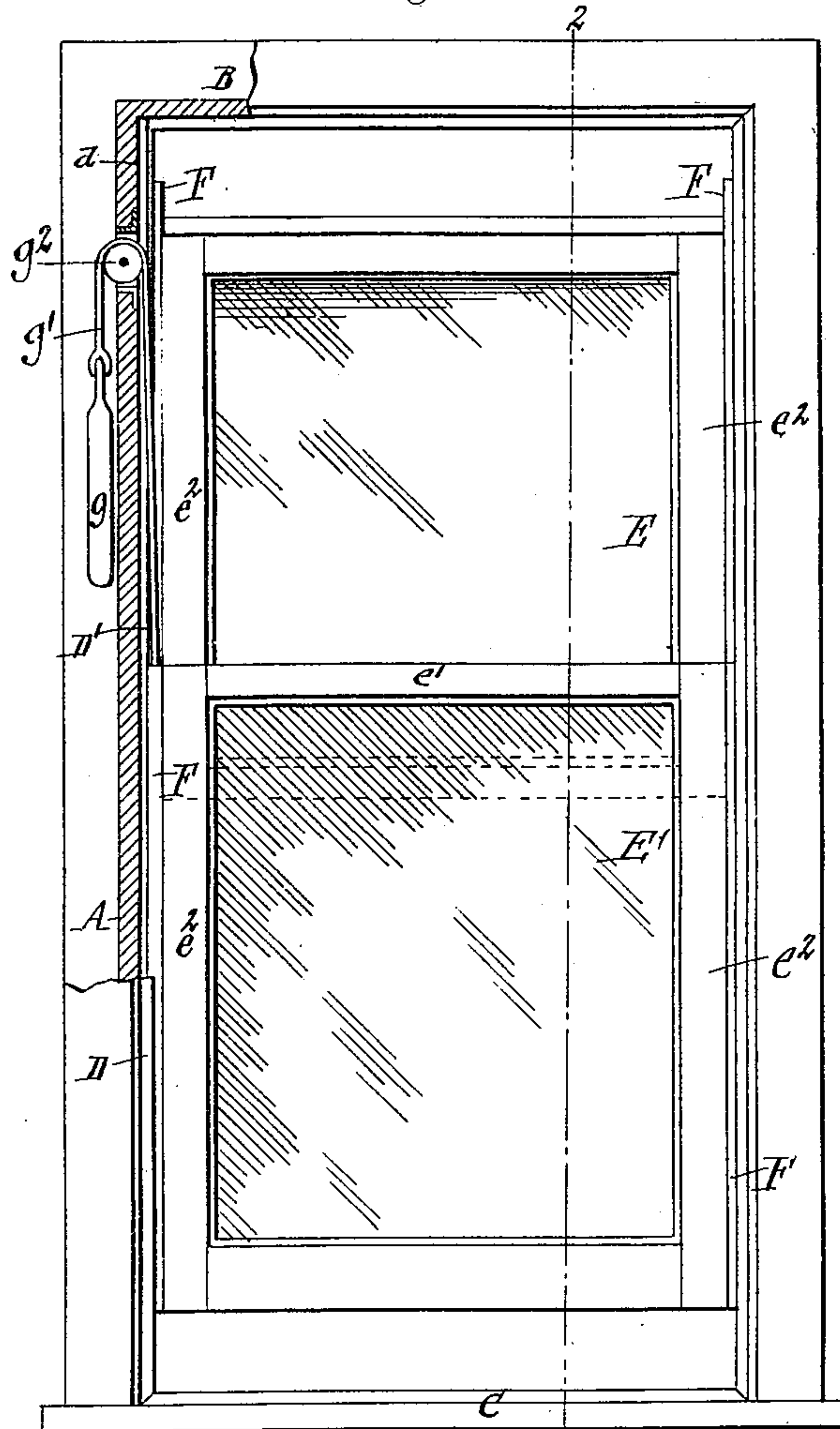


Fig. 2. Fig. 3.

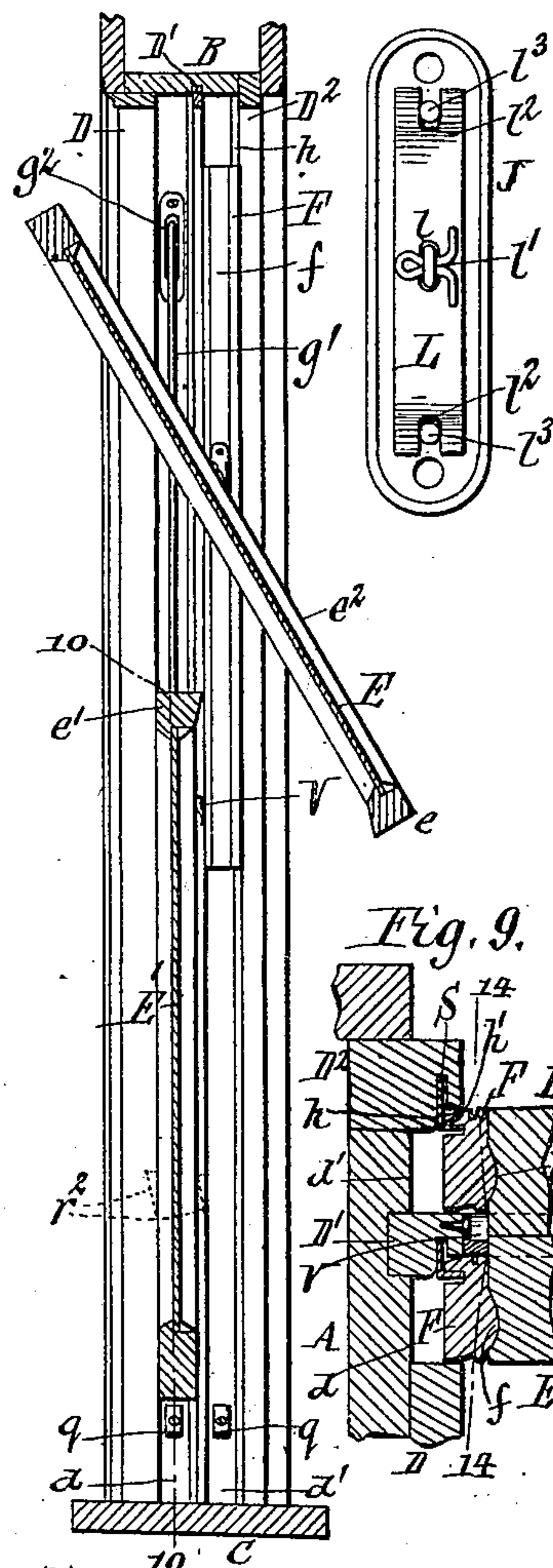


Fig. 9.

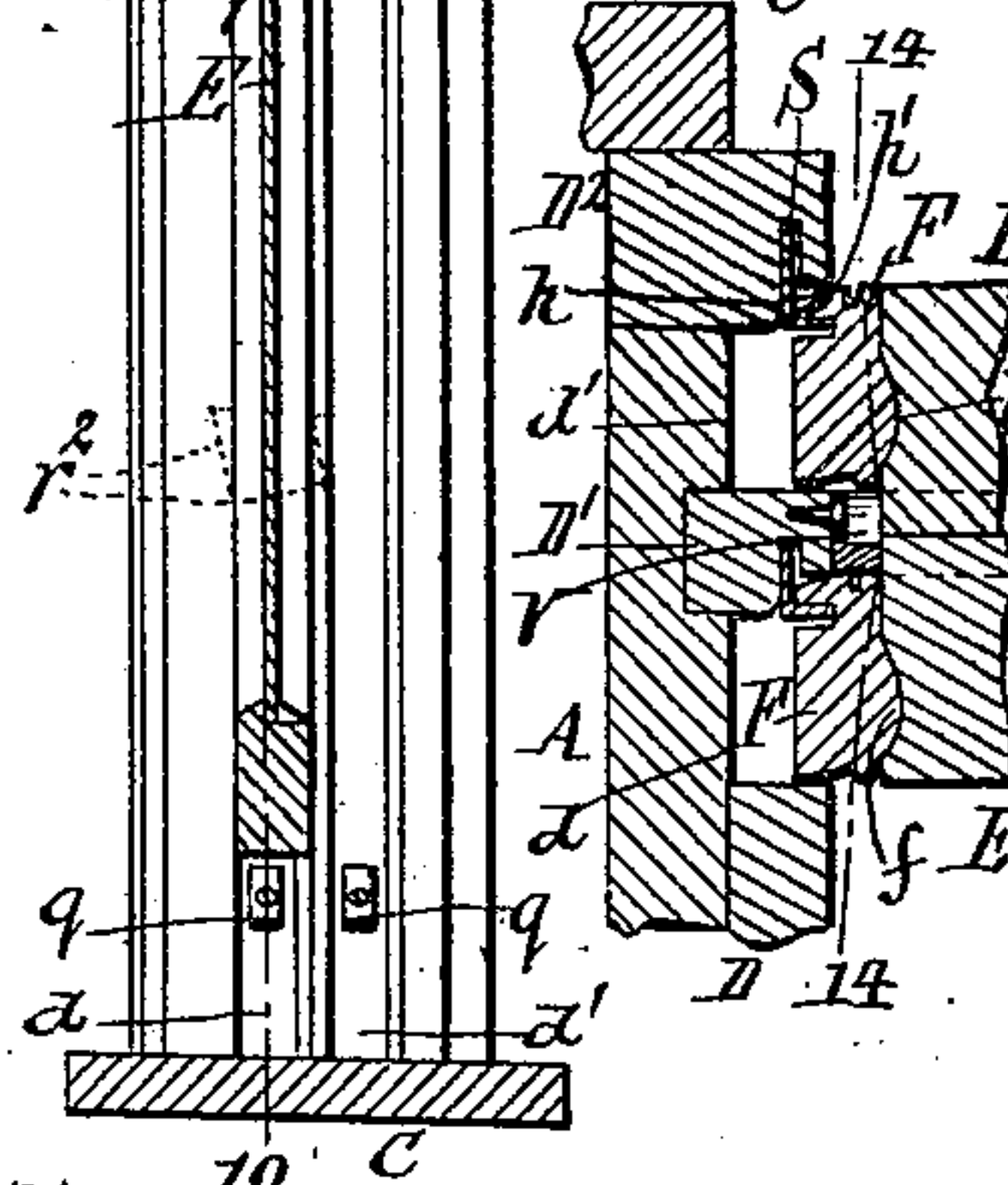


Fig. 4.

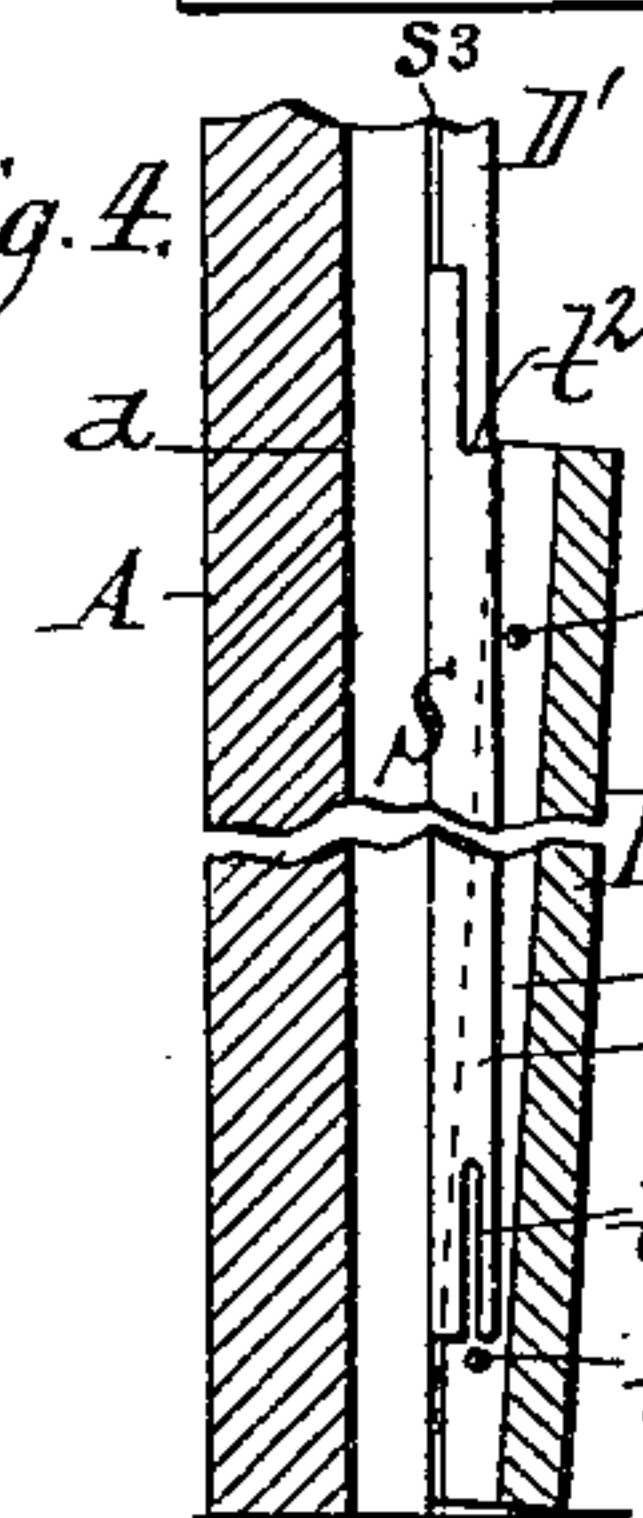


Fig. 5.

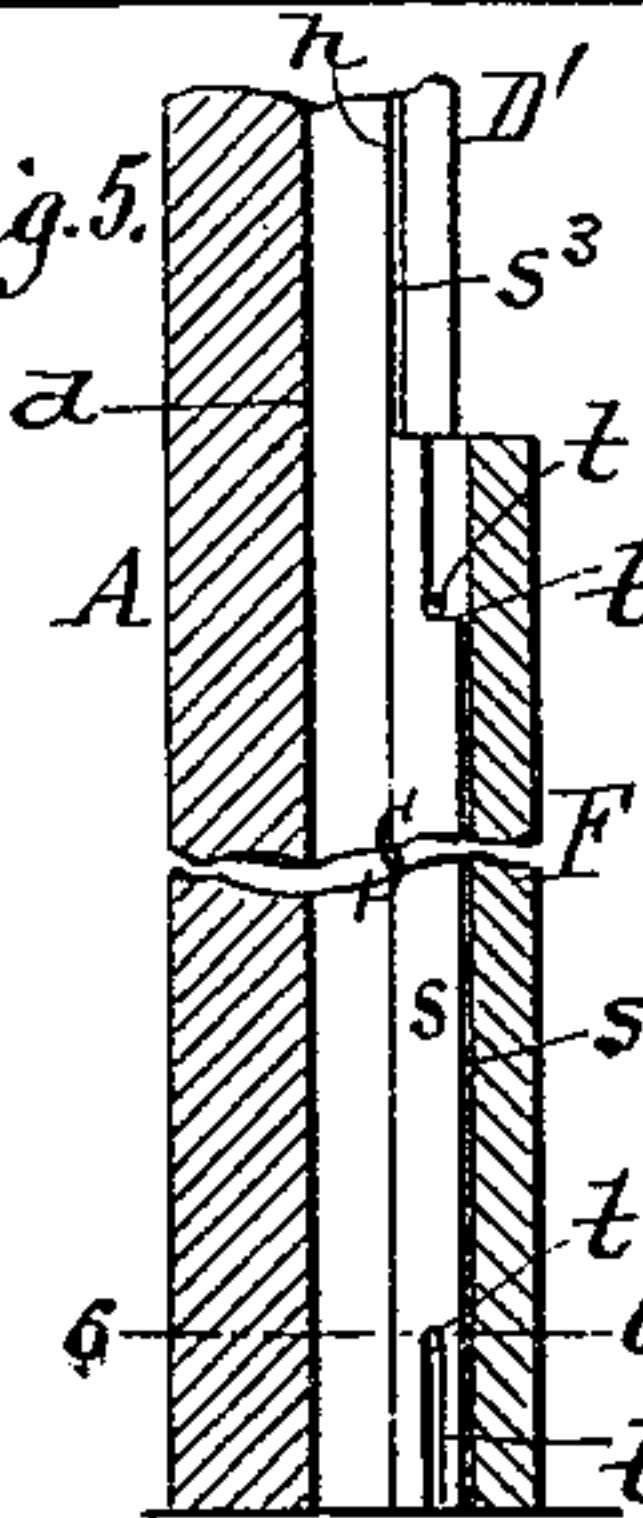


Fig. 6.

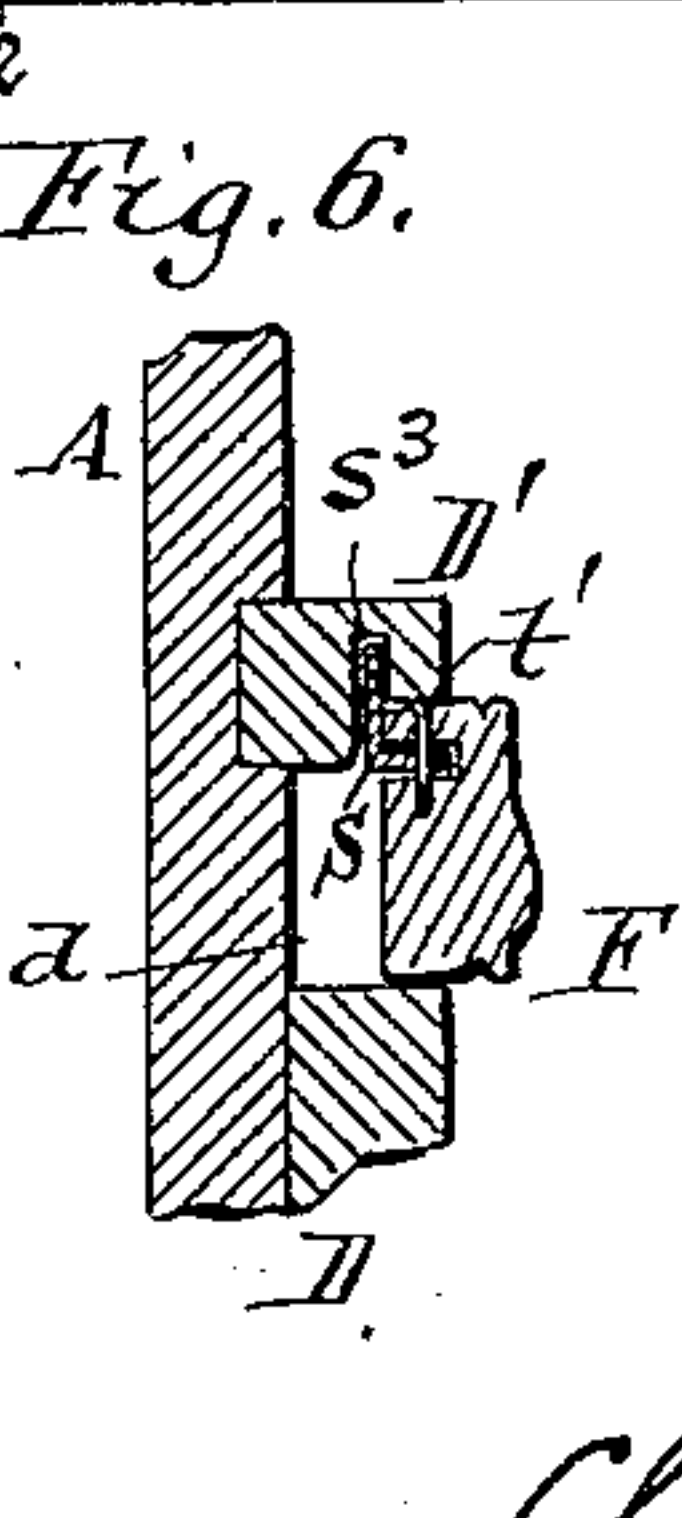


Fig. 7.

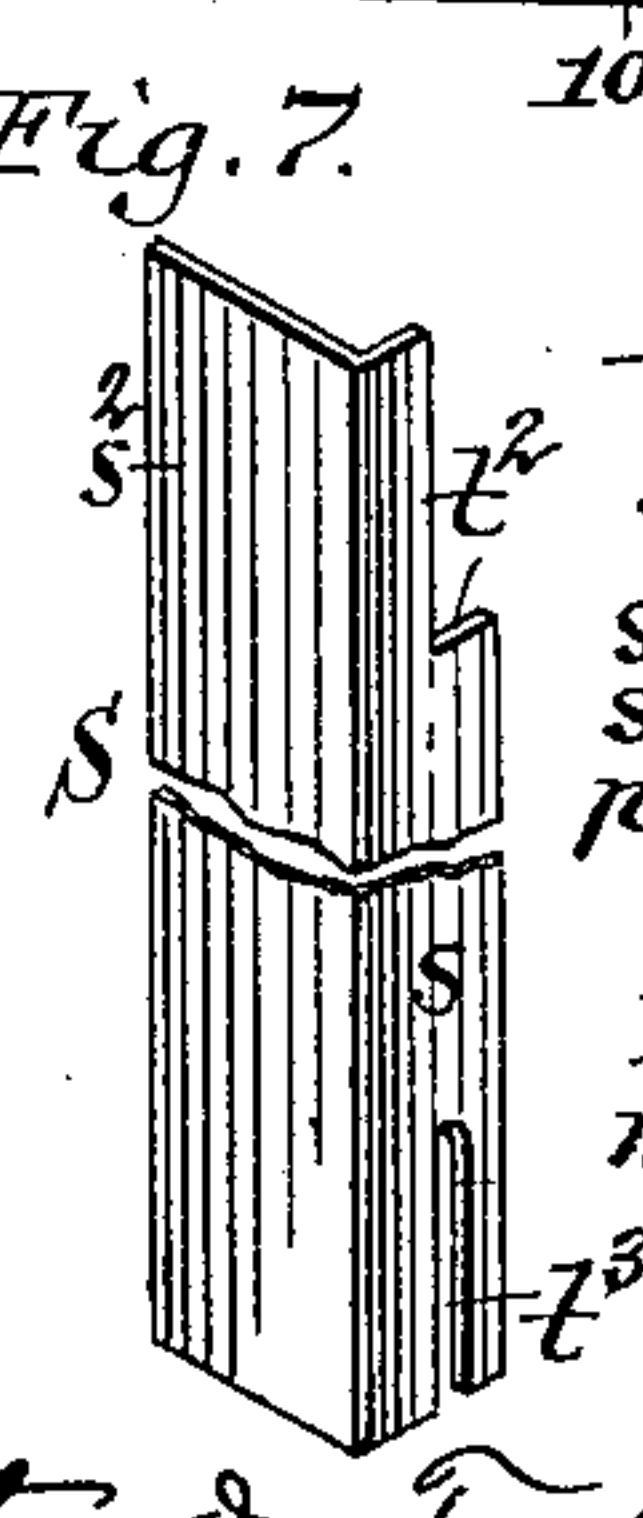
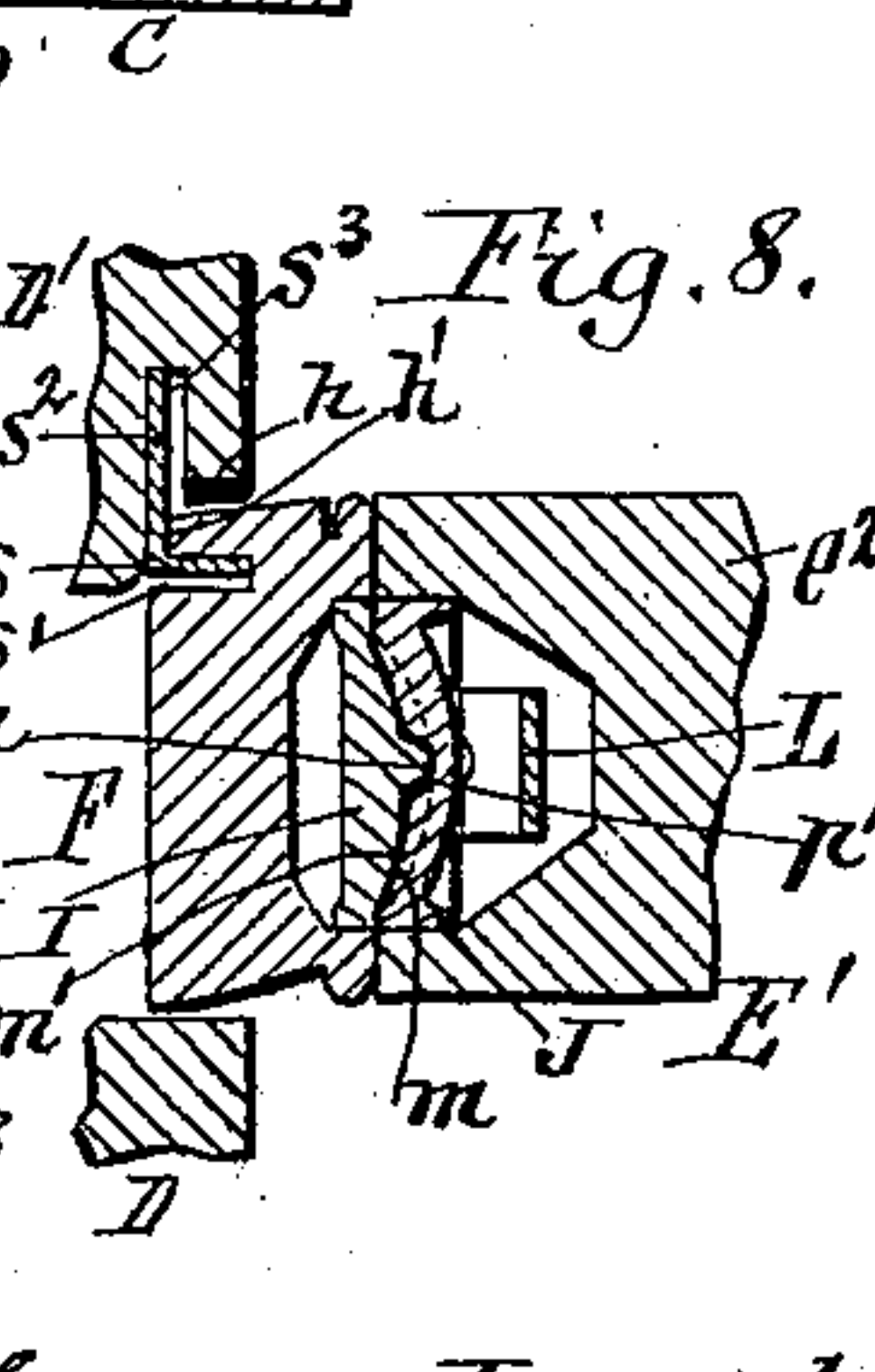


Fig. 8.



E. A. Volk;
F. P. Schurzinger. } Witnesses.

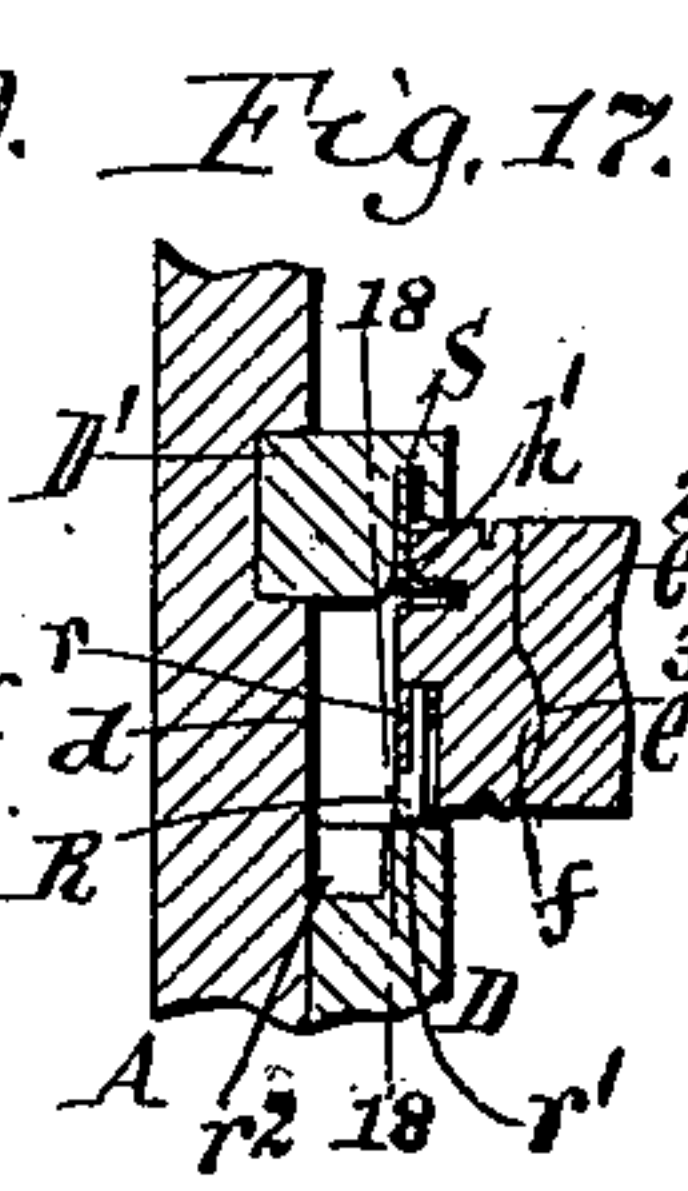
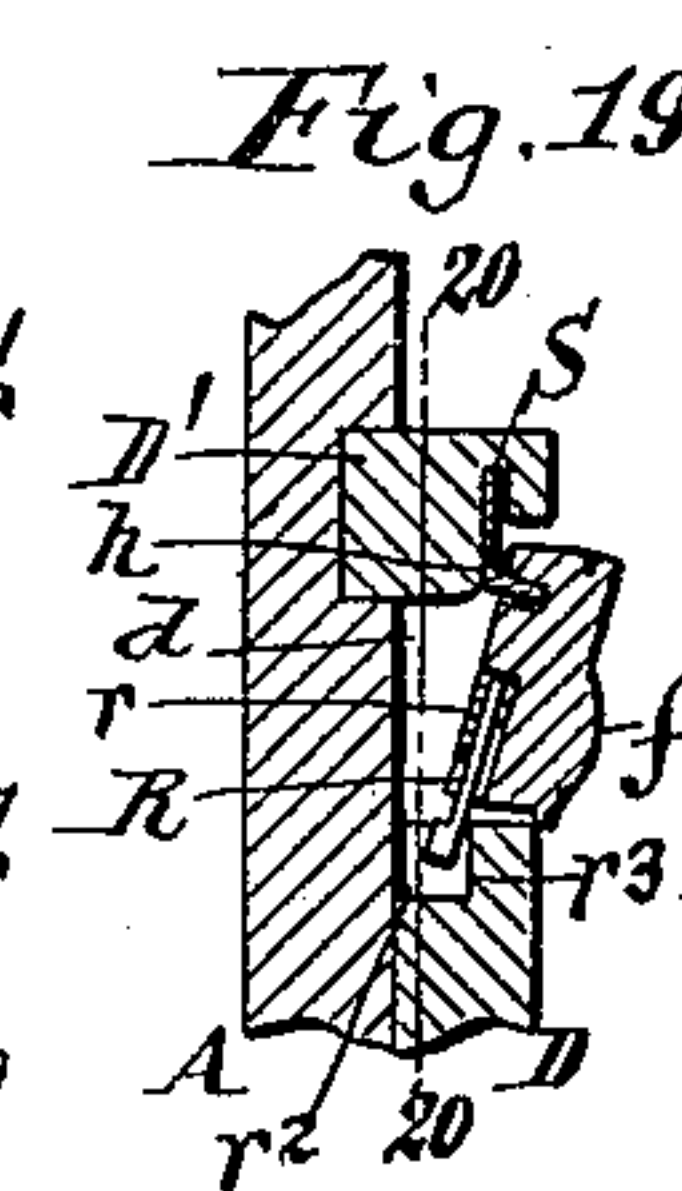
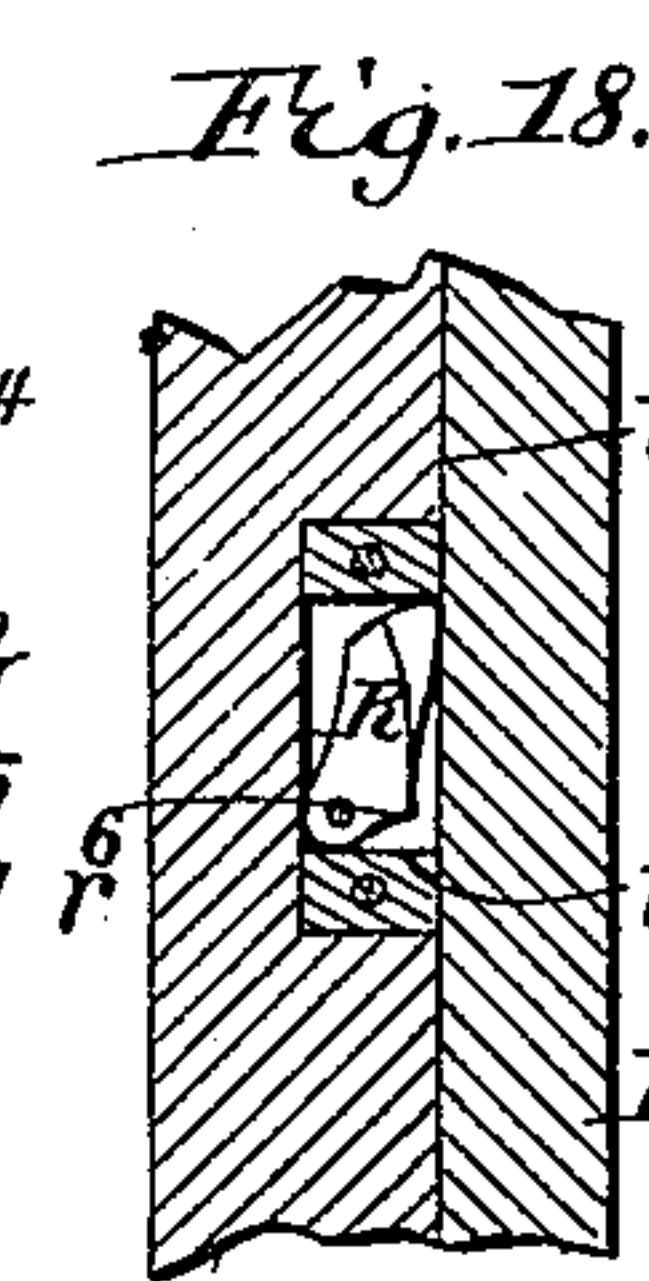
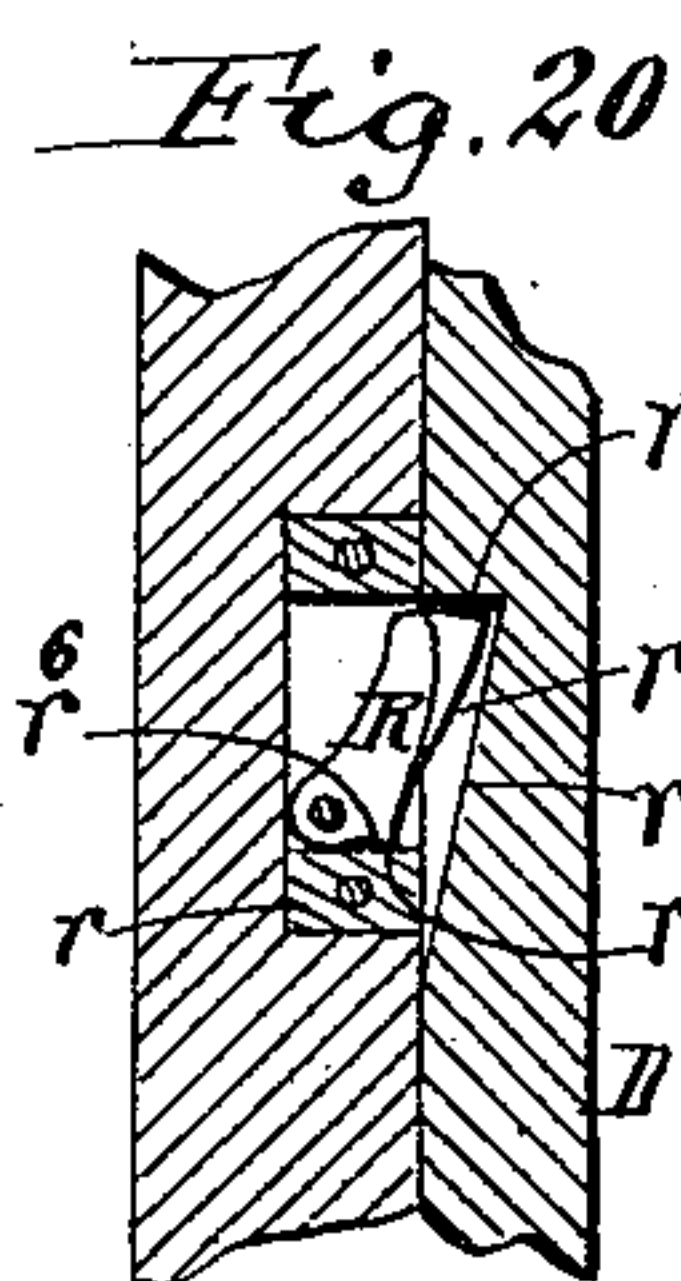
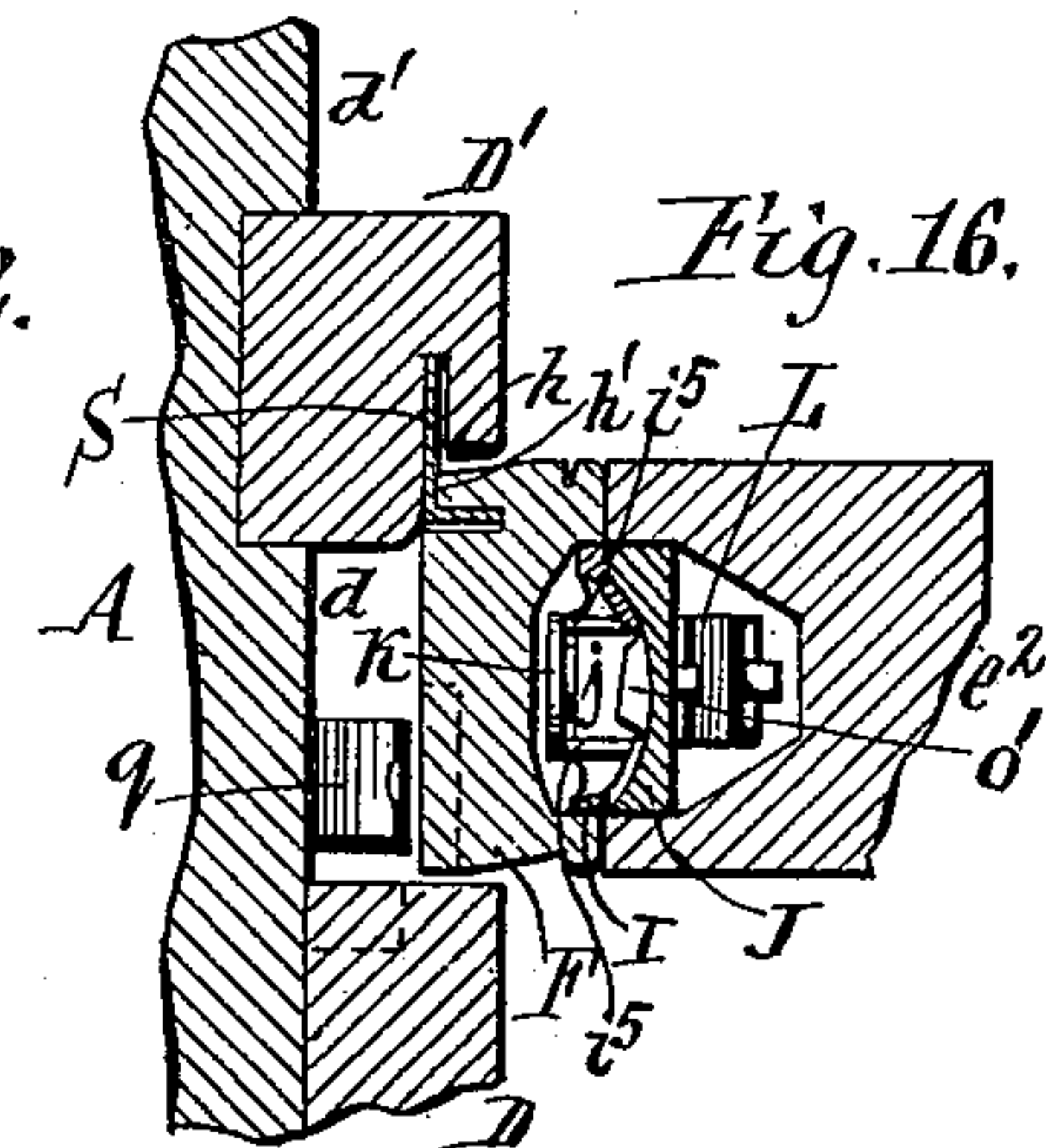
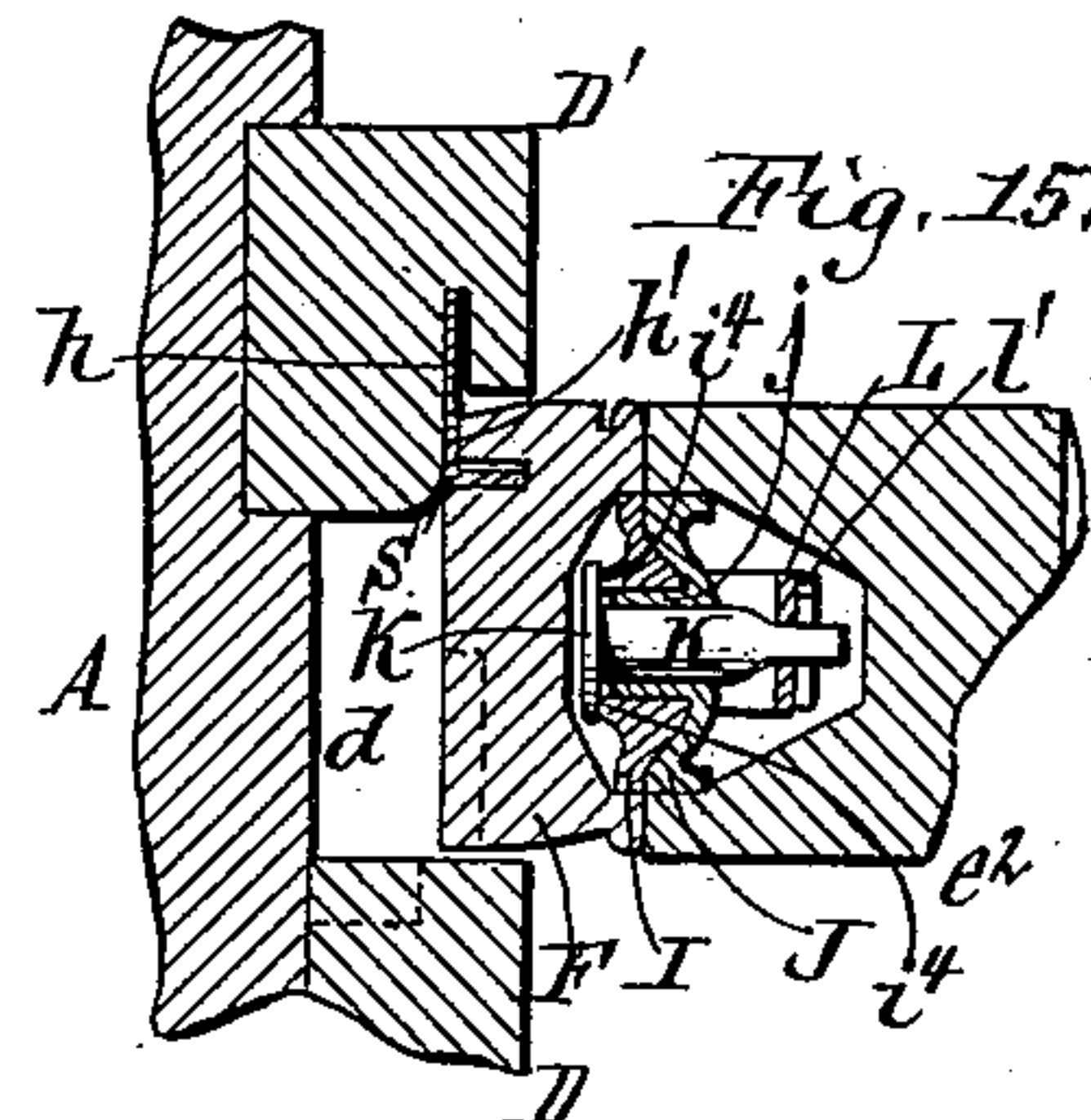
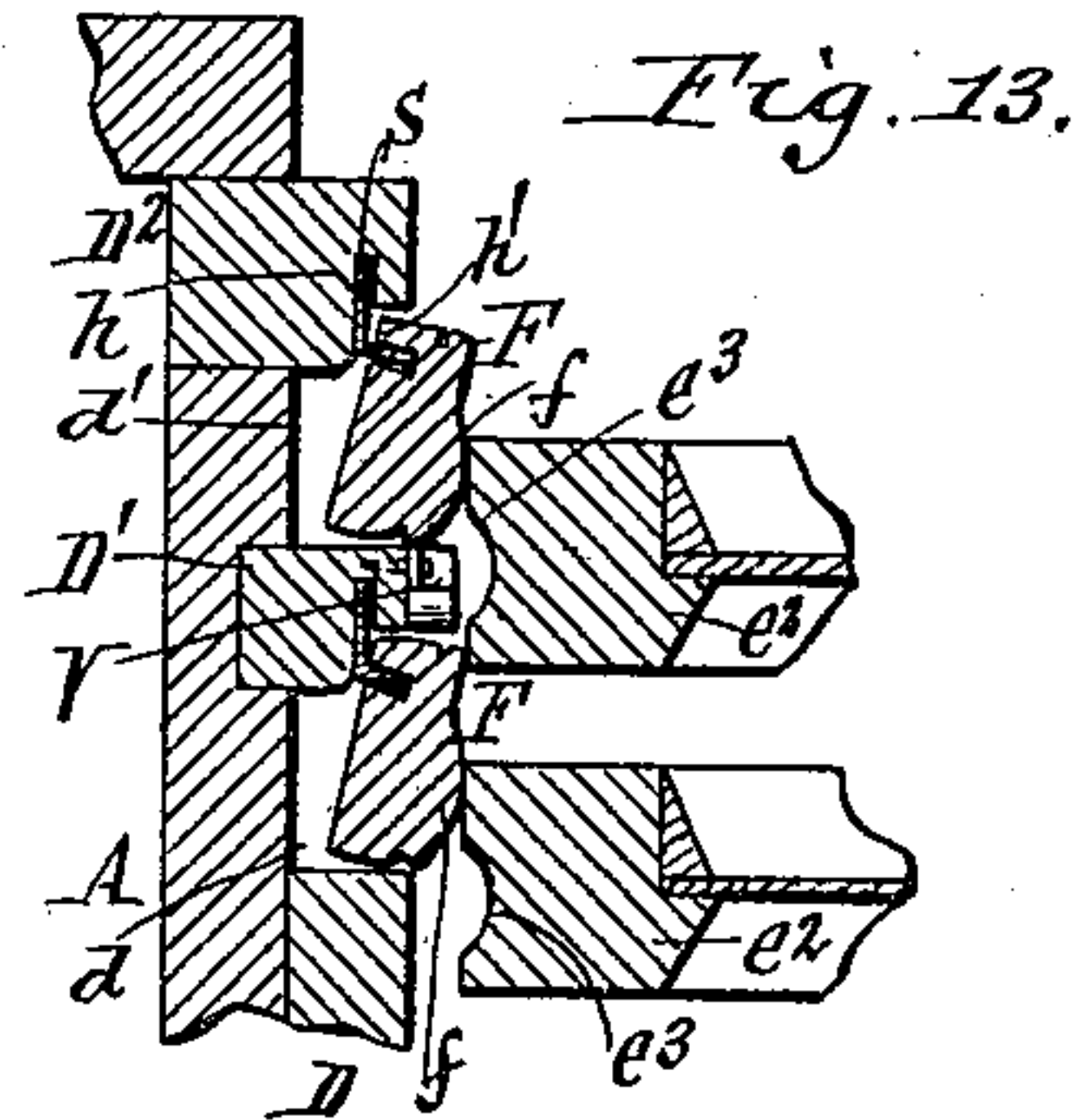
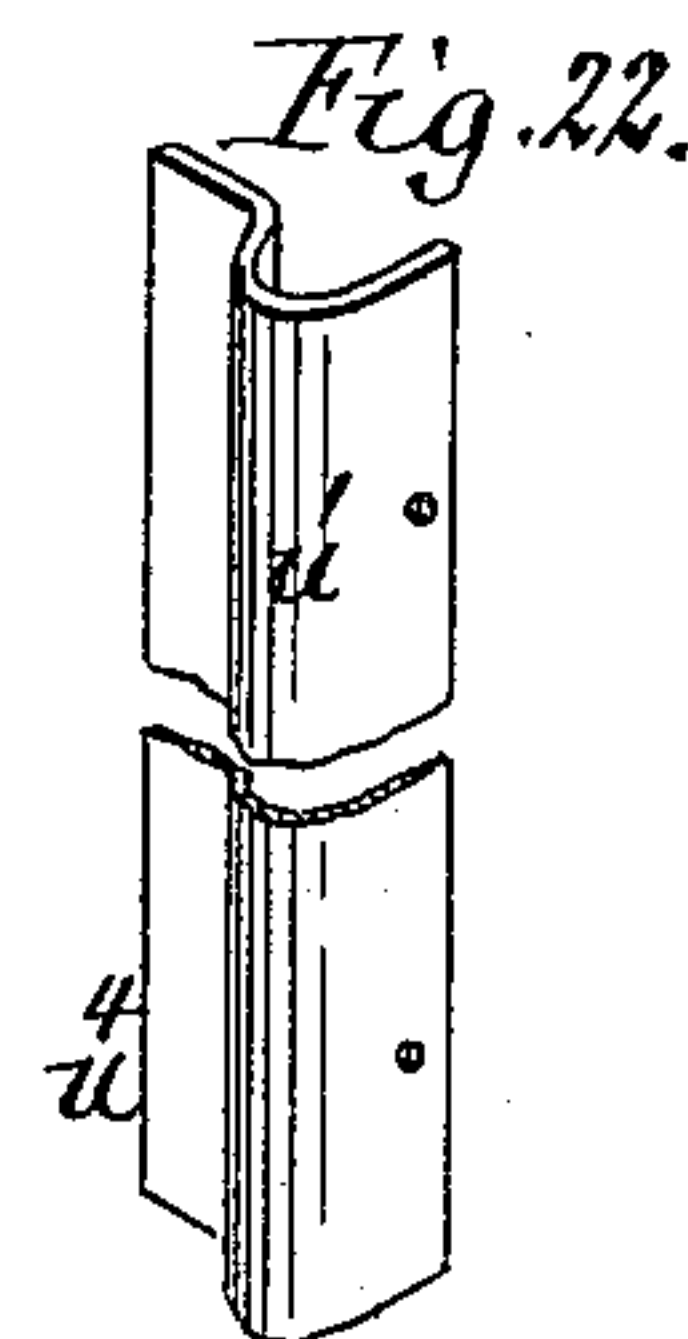
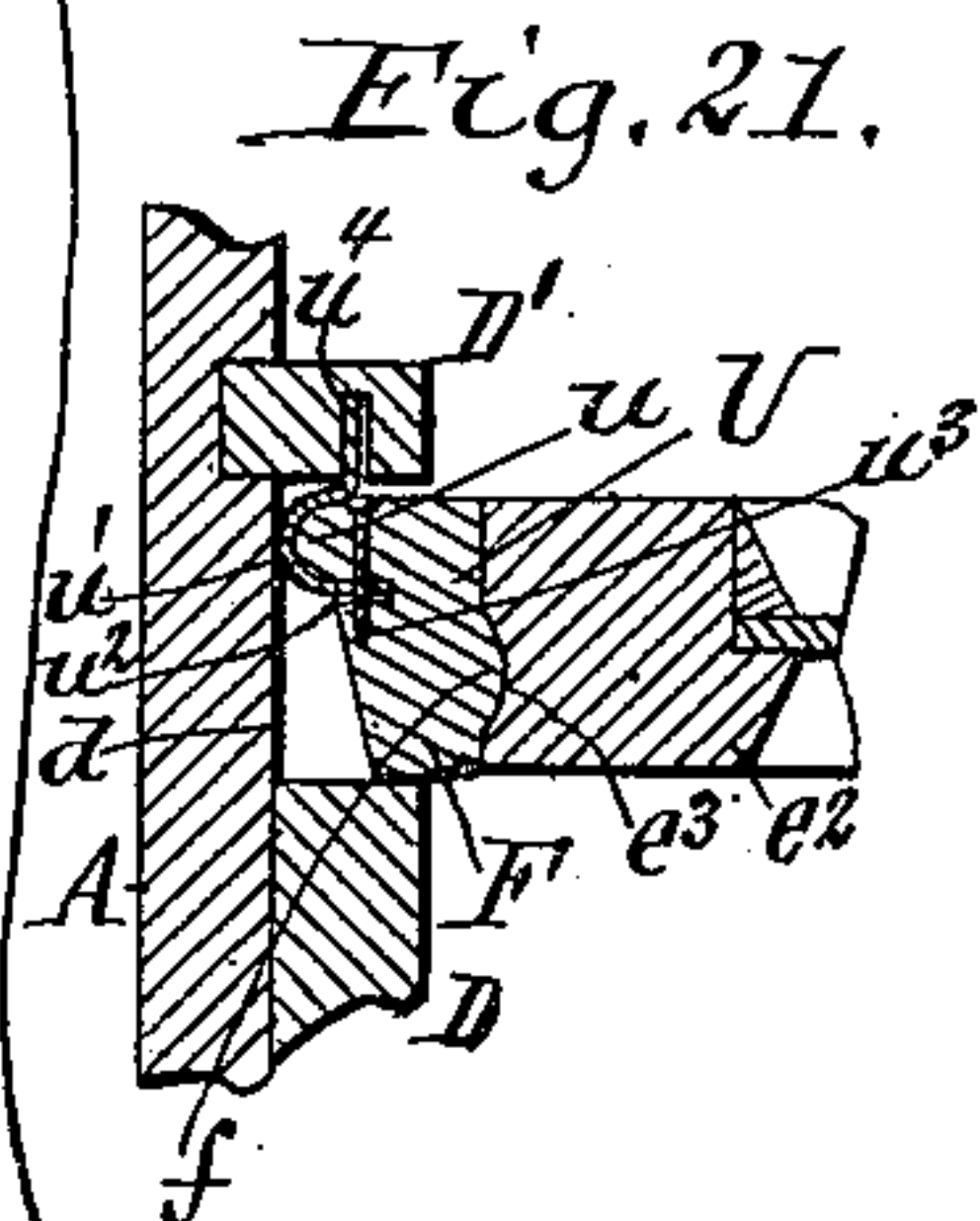
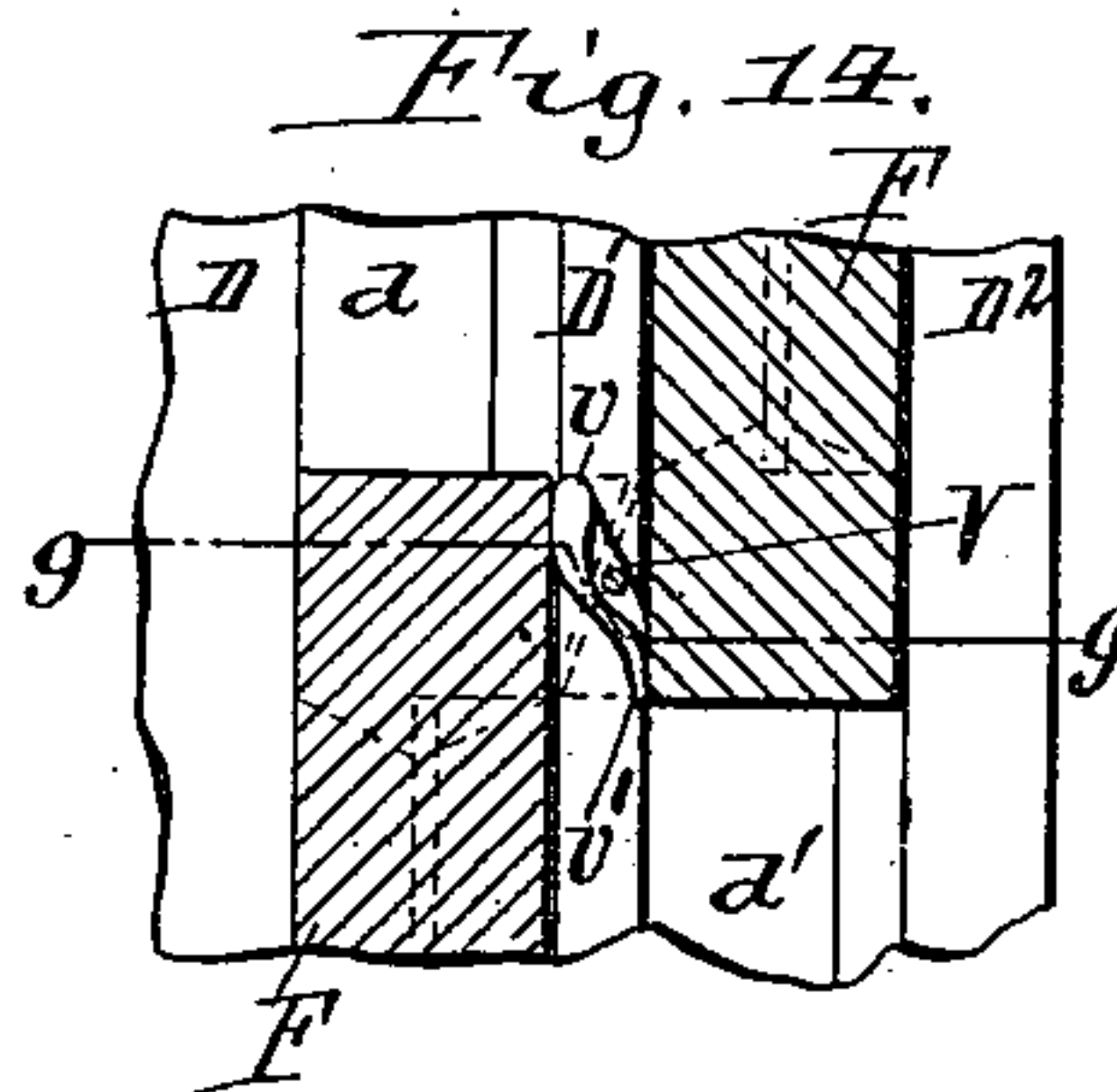
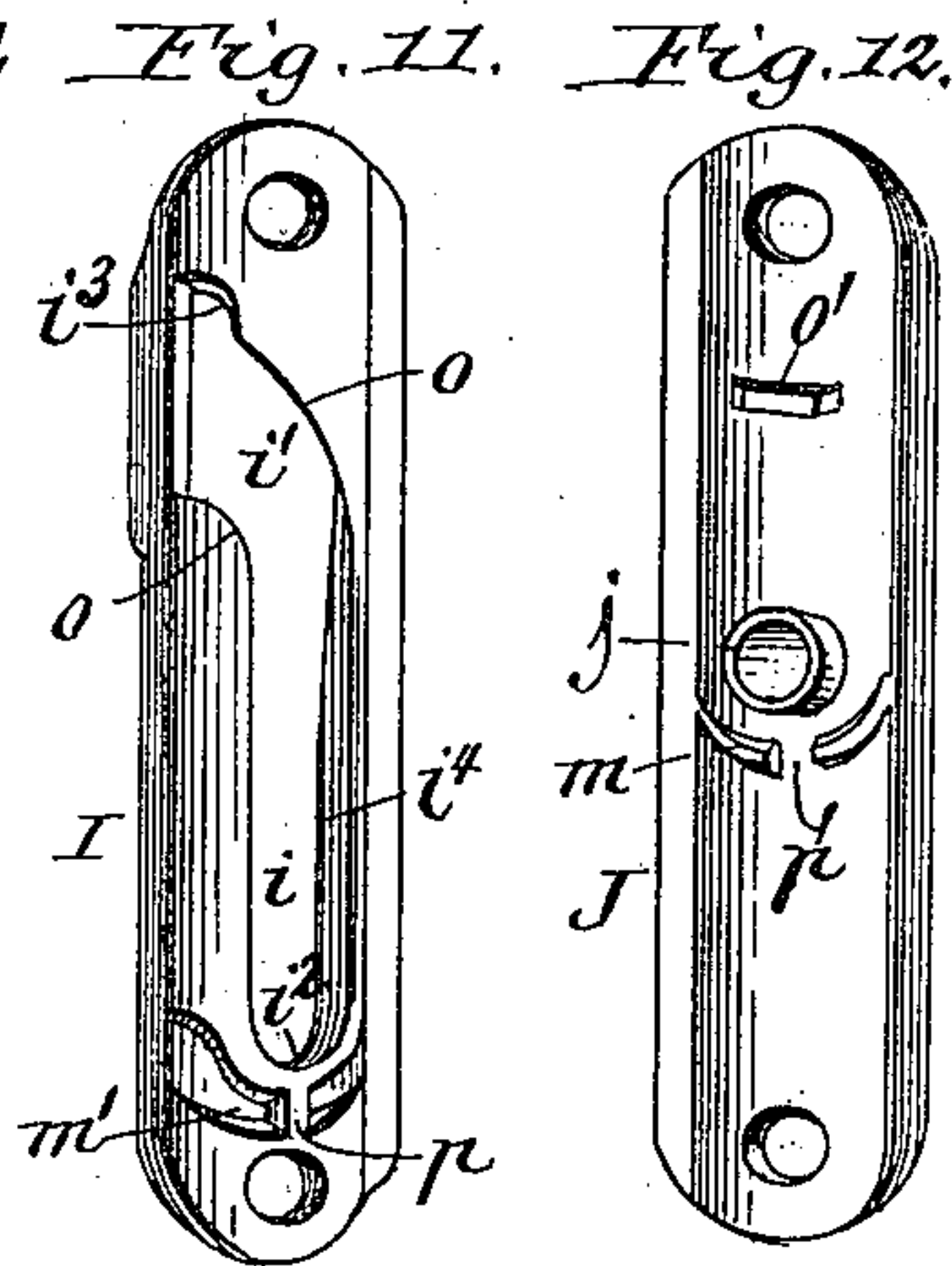
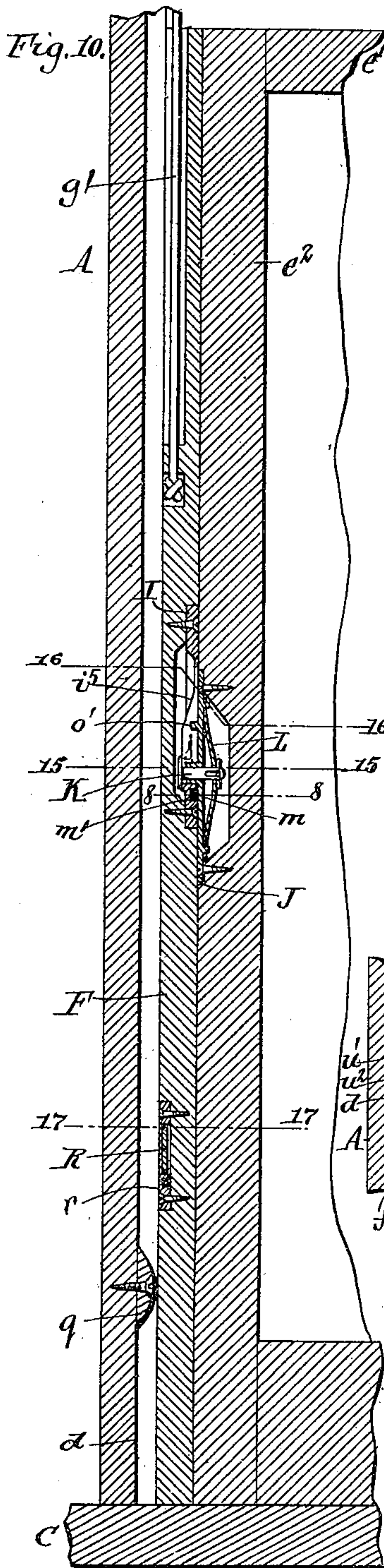
Clinton D. Tabor Inventor
By Wilhelm F. Bonnet Attorneys

C. D. TABOR.
WINDOW SASH.

(Application filed Oct. 31, 1899.)

(No Model.)

2 Sheets—Sheet 2.



E. A. Volk.
P. P. Schurzinger. } Witnesses.

Clinton D. Tabor Inventor.
By Wilhelm H. Bonner. Attorneys.

UNITED STATES PATENT OFFICE.

CLINTON D. TABOR, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE TABOR SASH COMPANY, OF SAME PLACE.

WINDOW-SASH.

SPECIFICATION forming part of Letters Patent No. 667,745, dated February 12, 1901.

Application filed October 31, 1899. Serial No. 735,371. (No model.)

To all whom it may concern:

Be it known that I, CLINTON D. TABOR, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented new and useful Improvements in Window-Sashes, of which the following is a specification.

This invention relates to windows in which the sashes can be slid up or down for opening or closing the window in the usual manner and which can also be turned on pivots, so that access may be had to both sides of the sash from the inside of the building. A window-sash of this kind is shown and described in Letters Patent No. 621,953, granted to Albert Schrafft and myself March 28, 1899, and the present improvements are particularly applicable to the window-sash shown in this patent, although some of the improvements are also applicable to window-sashes of different construction.

The objects of the present invention are to improve the means of pivoting the guide-bars on the window-frame; to simplify and improve the construction of the yielding pivotal connection or coupling between the sash and its guide-bars; to provide means for preventing the sashes from being accidentally detached from the guide-bars when in a vertical position; to prevent the edges of the sashes from being chafed by the coupling connecting the sashes and guide-bars; to prevent the sashes from being accidentally turned when in a lowered position; to improve the construction of the catches, whereby the guide-bars are held while removing the sashes from the guide-bars or attaching the same thereto; to provide simple means for preventing rain, wind, and dust from passing between the guide-bars and their guideways, and to provide improved means for preventing wind, rain, and dust from passing between the guide-bars, guide-stops, and meeting-rails when the sashes are closed.

In the accompanying drawings, consisting of two sheets, Figure 1 is an inside elevation, partly in section, of a window embodying my improvements and showing the upper sash tilted and the lower sash slightly raised. Fig. 2 is a vertical transverse section of the

same in line 2 2, Fig. 1. Fig. 3 is a rear elevation of one of the sash-plates and the parts mounted thereon. Fig. 4 is a fragmentary vertical section of the frame, guide-bar, and weather-strip, showing the parts in the position preparatory to connecting the bar with the weather-strip. Fig. 5 is a similar view showing the guide-bar connected with the weather-strip. Fig. 6 is a cross-section in line 6 6, Fig. 5. Fig. 7 is a fragmentary perspective view of the weather-strip. Fig. 8 is a cross-section, on an enlarged scale, in line 8 8, Fig. 10. Fig. 9 is a fragmentary horizontal section in line 9 9, Fig. 14, showing the sashes closed. Fig. 10 is a fragmentary vertical section, on an enlarged scale, of the lower sash in line 10 10, Fig. 2, showing the same in its normal lowermost position. Figs. 11 and 12 are perspective views of the coupling or sash plates, which are attached, respectively, to a guide-bar and the adjacent side of the sash. Fig. 13 is a fragmentary horizontal section similar to Fig. 9, showing both sashes tilted slightly. Fig. 14 is a fragmentary vertical section in line 14 14, Fig. 9, showing the weather-pawl between the meeting-rails of the sashes. Figs. 15 and 16 are fragmentary horizontal sections, on a still larger scale, in lines 15 15 and 16 16, Fig. 10, respectively. Fig. 17 is a fragmentary horizontal section in line 17 17, Fig. 10, showing the catch in its normal inoperative position. Fig. 18 is a vertical section thereof in line 18 18, Fig. 17. Fig. 19 is a horizontal section similar to Fig. 17, showing the catch in its operative position. Fig. 20 is a vertical section in line 20 20, Fig. 19. Fig. 21 is a fragmentary horizontal section showing a modified construction of the weather-strip. Fig. 22 is a fragmentary perspective view of the modified weather-strip.

Like letters of reference refer to like parts in the several figures.

A A represent the vertical pulley or side jambs, B the horizontal head-jamb connecting the upper ends of the side jambs, and C the horizontal sill connecting the lower ends of the side jambs. Each of the side jambs is provided on its innerside with an inner guide-stop D, an intermediate or check guide-stop D', and an outer or blind guide-stop D², the

several guide-stops forming inner and outer guideways d d' on the jambs, which extend from the sill to the head-jamb in the usual manner.

5 E E' are the upper and lower sashes, which abut with their meeting or check rails e e' and engage with their top and bottom rails, respectively, against the head-jamb and sill when the sashes are in their closed position.
 10 The width of the sashes is less than the space between the guide-stops on one side jamb and the guide-stops on the other side jamb, so that the sashes can move transversely between these two sets of stops. Each of the
 15 side stiles c^2 of the sashes is provided in its outer edge near one side with a longitudinal groove e^3 , Figs. 9, 13, and 17.

F represents vertical guide or hanging bars which support the sashes, so that the latter
 20 can be raised or lowered vertically for opening or closing the window in the usual manner, and also turned in a vertical plane, so as to permit either side of the panes to face inwardly for cleaning the same. Each of these
 25 guide-bars is provided on its inner edge near one side with a longitudinal bead, rib, or tongue f , which engages with the groove in the outer edge of one of the sash-stiles, and the outer edge of the guide-bar is arranged
 30 in the adjacent vertical guideway of the frame. The guide-bars on opposite sides of each sash are connected with counterbalancing-weights g by cords g' passing around pulleys g^2 on the side jambs.

35 One of the guide-stops of each guideway is provided with a rabbet, groove, or shoulder h , against which the adjacent corner h' of the respective guide-bar bears. As shown in Fig. 9, these rabbets are formed on the inner corners
 40 of the outer and intermediate guide-stops, and the guide-bars bear against the same, with the corners at the junction of their inner edges and outer sides diagonally opposite the tongues on the guide-bars.

45 In the normal vertical position of each sash the guide-bars on opposite sides thereof are turned horizontally outwardly and engage with their tongues in the grooves of the sash-stiles, as represented in Fig. 9. Upon turning
 50 the sash vertically with reference to the guide-bars the latter are turned horizontally inwardly by the wedge or cam action of its grooves against the tongues of the guide-bars, as represented in Fig. 13. During this turning
 55 movement of each guide-bar the same swings transversely, with its corner h' at one side on the adjacent rabbet h as a fulcrum and its opposite side moves toward and from the back of the respective guideway, which
 60 latter is deep enough to permit of this transverse movement of the guide-bar.

The stiles of each sash are each connected with the adjacent guide-bar by a detachable pivot coupling or connection, which is constructed as follows:

65 I and J , Figs. 3, 8, 10, 11, 12, 15, and 16,

represent two coupling-plates, which are secured to the central opposing parts of the companion guide-bars and sash-stiles and which are arranged over recesses formed, respectively, in these parts. The face of the
 70 guide-bar coupling-plate I is provided with a convex tongue or rib engaging with a concave groove in the plate of the sash, as shown in Figs. 8, 11, 12, and 15, so as to conform to
 75 the interlocking tongue and groove of the guide-bar and sash on which the coupling-plates are mounted. The plate I is provided with a bayonet socket or slot, consisting of a lower portion i , which extends vertically
 80 lengthwise of the plate, and an upper portion i' , which curves laterally and inwardly from the upper end of the lower portion. The lower end of this slot is semicylindrical, as
 85 shown at i^2 , Fig. 11, forming a seat or bearing which receives a horizontal cylindrical trunnion or stud j on the sash-plate J , thereby pivotally supporting the sash on the guide-bar and permitting the sash to be turned in
 90 a vertical plane. The upper end of the slot in the guide-bar plate is undercut, as shown at i^3 , Fig. 11, and the inner side of this plate is provided on opposite sides of the lower
 95 portion of its slot with vertical ribs i^4 , having inclined upper ends i^5 .

K represents coupling or tension bolts whereby the sash and the guide-bars are drawn together. One of these bolts is arranged in the trunnion of each sash-plate and is provided at its outer end with a head k ,
 100 which bears against the inner side of the ribs on the adjacent guide-bar plate when the parts are assembled in their operative position, as shown in Figs. 10, 15, and 16.

L represents a flat bow-spring arranged in
 105 the recess in the sash-stile and bearing with its ends against the back of the sash-plate J . The central part of the spring is provided with a perforation l , which receives the inner end of the tension-bolt and is secured thereto by
 110 a transverse spring-pin l' , passing through the tension-bolt, as shown in Figs. 3 and 15. The ends of the spring are provided with notches l^2 , which engage with lugs l^3 on the inner side of the sash-plate, and the central perforation of the spring and the inner end of the
 115 tension-bolt arranged therein are flat-sided, as shown in Fig. 3, thereby compelling the spring and bolt to turn with the sash and trunnion.

120 The sash is connected to its guide-bar by introducing the heads of its tension-bolts into the upper undercut ends of the slots of the guide-bar plates and then moving the sash downwardly until the trunnions of the sash
 125 engage with the bottoms of said slots. During the downward movement of the sash the heads of the bolts engage with the inclined upper ends of the ribs on the guide-bar plates and are raised upon the high part thereof, so
 130 that the bolts are drawn outwardly and the springs are strained when the sash is in its

operative position, thereby causing the sash and guide-bars to be yieldingly drawn together and producing a tight joint between these parts. Each trunnion is of such length
 5 that the head of its bolt rests against the outer end of the trunnion when the sash is detached and holds the head in the proper position to enter the socket of the guide-bar. Upon tilting the sash in either direction it
 10 turns with its trunnions in the bearings of the guide-bars and the guide-bars are deflected backwardly by the incline or cam action of the interlocking grooves and tongues, whereby the tension-bolts are drawn out-
 15 wardly from the sash-plates and the springs are further strained. When the sash is again restored to its vertical position, so that its grooves are in line with the tongues of the guide-bars, the latter are drawn against the
 20 sash by the resilience of the springs. It will thus be seen that the sash is supported upon the guide-bars solely by the trunnions and that the tension-bolts simply serve to draw the guide-bars against the sash.

25 In order to prevent the sash from being lifted accidentally out of its bearings on the guide-bars upon raising the sash when the latter is in its lower vertical position, each of the plates on the sash is provided below its
 30 trunnion with a concentric segmental lug m , which engages with a correspondingly-shaped groove m' on the opposing guide-bar plate, below the slot thereof, as represented in Figs. 8, 10, 11, and 12. The cooperating sides or
 35 shoulders of the segmental lug and groove are square or abrupt, thereby preventing the sash from being raised independent of the guide-bar so long as the same is in a vertical position and the segmental lug of its plate is in-
 40 terlocked with the segmental groove of the guide-bar. When it is desired to detach the sash from its guide-bars, the sash is first turned until the guide-bars have been deflected sufficiently to disengage the segmental
 45 grooves in their plates from the segmental lugs of the sash-plates, after which the sash can be lifted, with its tension-bolts and trunnions, out of the slots of the guide-bar plates and detached from the guide-bars.

50 As the sash is turned on its trunnions the upper curved edges $o o$ of the slot in the guide-bar plate and the edges of the segmental groove m' of this plate tend to chafe the adjacent parts of the side edges of the sash. In
 55 order to prevent the curved edges $o o$ of the guide-bar plate from chafing the edge of the sash, the plate of the latter is provided in its groove above the pivot with a guard or bearing lug o' , which fits into the slot of the guide-
 60 bar plate when the parts are in their normal position, as represented in Figs. 10 and 16. The ends of this lug are beveled, as shown in Fig. 16, so that upon turning the sash in either direction the guard-lug assists in deflecting
 65 the adjacent guide-bar by engaging with one of its beveled ends against one edge of the slot in the guide-bar plate, and then the guard-

lug rides on the high part of the guide-bar plate and guides the sash over the chafing
 edges $o o$ until the sash has cleared these
 70 edges. Upon turning the sash back to its normal position the guard-lug holds the sash away from the guide-bar until the sash is vertical, and then the guard-lug drops into the slot of the guide-bar plate.

75 In order to prevent the edges of the segmental groove from chafing the edge of the sash, a web or bridge p is arranged across this groove in line with the highest part of its convex face, as shown in Figs. 8 and 11.
 80 The web guides the edge of the sash over the edges of the segmental groove and prevents chafing of the edge of the sash. When the sash is in its normal vertical position, the web
 85 p engages with a recess p' in the segmental lug m , which permits the guide-bar and sash to be drawn together. The sides of the web and its cooperating recess are beveled, as shown in Fig. 8, so as to permit of turning the
 90 sash and deflecting the guide-bar.

In order to prevent accidents to persons who lean against the sashes, the latter are prevented from turning when in their lower position by stops q , which are secured to the
 95 back of the guideways behind the path of the guide-bars. When the sash is lowered with its guide-bars in front of the stops in their guideways, the guide-bars are prevented from being deflected backwardly into their guide-
 100 ways by reason of the stops obstructing this movement, thereby preventing turning of the sash while in this position. When it is desired to turn the sash, it must be first shifted until its guide-bars clear the stops q , and then
 105 the guide-bars are free to move backwardly and permit turning of the sash. The stops q of each sash are arranged horizontally in line and suitable distance from the lower end of the guideways, thereby holding the sash
 110 against turning while in its lower position and necessitating raising of the same until its guide-bars clear the stops q before the sash can be turned for cleaning or removing the same from the guide-bars.

115 R represents catches whereby the guide-bars are held against upward movement when it is desired to disengage the sash therefrom, and the guide-bars are also held in a backwardly-deflected position while the sash is removed therefrom, thereby permitting the
 120 sash to be conveniently removed from and attached to the guide-bars. One of these catches is pivoted horizontally at its lower end to a plate r , which is secured to the lower free portion of each guide-bar, so that the
 125 catch swings at right angles to the swinging movement of the guide-bar. Upon raising or lowering the sash when it is arranged vertically and its guide-bars are swung forwardly into their operative position the catches of
 130 the guide-bars are retracted and slide up and down in engagement with the outer continuous bearing portion or face r' of the adjacent guide-stop, as shown in Figs. 17 and 18. The

catches are held in engagement with the continuous face of this guide-stop by gravity, the upper end of the catch being made heavy and leaning toward this stop for this purpose.

5 Each of these guide-stops is provided inwardly from its continuous bearing-face r' with a notch or recess r^2 , forming an outwardly-facing vertical shoulder r^3 at the outer side of the recess, as shown in Fig. 19, a

10 downwardly-facing shoulder r^4 at the upper end of the recess, as shown in Fig. 20, and an incline r^5 on the back of the recess. When it is desired to disengage the sash from the guide-bars, the sash is first tilted, so that its

15 guide-bars are deflected or moved into the guideways, whereby the catches of the guide-bars are moved into line with the recesses r^2 of the adjacent guide-stops, and then the sash while so tilted is raised, together with the

20 guide-bars. During this upward movement of the sash and guide-bars the catches of the latter drop into the recesses r^2 of the guide-stops as soon as they reach the same and engage with the upper shoulders thereof, as

25 shown in Fig. 20, thereby arresting the upward movement of the guide-bars. During the continued upward movement of the sash independent of the guide-bars the pivots of the sash are disengaged from the sockets of

30 the guide-bars. When the sash is removed from its guide-bars, the latter are retained in their retracted position by their catches engaging with the outer shoulders r^3 of the recess in the guide-stops, as shown in Fig. 19,

35 in which position of the guide-bars their sockets are held in the proper position to permit the pivots of the sash to be conveniently re-engaged with the sockets of the guide-bars. After the sash has been again attached to the

40 guide-bars the same are moved downwardly together, whereby the lower inclined sides r^5 of the recesses disengage the catches from the recess, thereby releasing the guide-bars and permitting the same to be drawn for-

45 wardly against the sash, in which position of the bars their catches again stand opposite the continuous faces r' of the guide-stops and the sash and guide-bars can be raised and lowered freely. The recesses r^2 of the guide-

50 bars are located so high, as shown by dotted lines, Fig. 2, that the catches are engaged therewith after the guide-bars have been raised sufficiently to clear the stops q . The lower end of each catch is provided with a

55 shoulder r^6 , which engages with a shoulder r^7 on its supporting-plate, as shown in Fig. 20, thereby preventing the catch from swinging out of its operative position when the guide-bars are removed from its guideway.

60 In order to prevent rain, dust, or wind from passing between the window-frame and the guide-bars, the space between each guide-bar and the frame is closed by a weather-strip S . As shown in Figs. 4, 9, 15, and 17, this strip

65 is bent into an angular or L-shaped form and is fastened with its inner flange s in a longitudinal slit s' in the inner side of the guide-

bar, while its other flange s^2 slides in a longitudinal slit s^3 , formed in the guide-stop on which the guide-bar is fulcrumed. The

70 weather-strip is of the same length as the guide-bar and consists, preferably, of sheet-zinc, which prevents the strip from freezing and sticking or clinging to the guide-stop in cold weather. Upon raising or lowering the

75 sash the weather-strips of its guide-bars slide in their guide-stops, and when tilting the sash the strips are sprung or bent slightly, as shown in Fig. 13, this slight bending of the strip being permitted by the flexibility of the

80 metal. Each weather-strip is preferably detachably connected with its guide-bar by two fastening nails, pins, or screws t t' , arranged in the bar across the upper and lower portion of its slit, and the upper one of which

85 engages with an upwardly-facing shoulder t^2 on the upper part of the inner flange of the strip and the lower one of which engages with the upper end of a slot t^3 in the lower part of the inner flange of the strip, as shown in Fig.

90 5. The guide-bar and strip are connected by first passing the slotted lower end of the strip over the lower nail t' of the bar while the latter is in an inclined position, as shown in

95 Fig. 4, and then moving the upper part of the bar, with its upper nail t , over the upper shoulder t^2 of the strip, this operation being reversed when it is desired to separate the strip and bar. If desired, the weather-strip may

100 be permanently attached to the guide-bar.

In Fig. 21 my improved weather-strip is shown applied to a guide-bar U , which is fulcrumed by means of a rib u on one of its edges bearing against the back of the guideway of the frame. In this construction of

105 the guide-bar the weather-strip is provided with a curved inner part u' , as shown in Figs. 21 and 22, which is interposed between the back of the guideway and the rib of the guide-bar and secured in a slit u^2 in the latter by

110 nails u^3 and a flange u^4 , arranged at one end of the curved part and sliding in a slit in the adjacent guide-stop.

When the sashes are both in their closed position, gaps or spaces are formed between

115 the ends of the check or meeting rails and the opposing parts of the guide-bars and the adjacent parts of the intermediate guide-stops. Each of these spaces is closed when the sashes are closed by a weather trap or

120 pawl V , as shown in Fig. 9. This pawl is pivoted to the adjacent intermediate guide-stop of the frame, so as to turn in the same plane as the sashes, and is of the same width at the distance from the intermediate guide-stop to

125 the ends of the overlapping check or meeting rails of the sash, as shown in Fig. 9. The weather-pawl is provided with an upwardly-projecting arm v , which bears against one of the adjacent guide-bars, and with a down-

130 wardly-projecting arm v' , which bears against the other guide-bar, as represented in Fig. 14. The upper arm of the pawl is weighted, so that it is heavier than the lower light arm,

which tends to turn the pawl constantly in the direction for pressing its arms against the opposing guide-bars, thereby effectually excluding rain and wind at this place. The

5 bearing-faces of the pawl-arms are made sufficiently long so that these arms will not clutch or grip the guide-bars of the sashes, but will bear loosely against the same upon raising or lowering the sashes. The weather-
10 pawl adjusts itself to the guide-bars by gravity and automatically compensates for the shrinking, swelling, or variation in the parts adjacent to the pawl, thereby preventing cramping or binding between these parts.

15 I claim as my invention—

1. The combination with a window-frame having a pair of guide-stops one of which is provided with an outwardly-facing rabbet, of a guide-bar capable of turning transversely
20 between said stops and fulcrumed on said rabbet, and a window-sash connected with said guide-bar, substantially as set forth.

2. The combination with a window-frame provided with guide-stops forming a guide-
25 way, and a sash which clears said stops, of a guide-bar arranged in said guideway and provided on its outer edge near one side with a tongue which engages with a groove in the sash and bearing with its diagonally opposite
30 corner against a rabbet on the adjacent guide-stop, and a coupling connecting the guide-bar and sash, substantially as set forth.

3. The combination with a window-frame provided on opposite sides with guide-stops forming vertical guideways, and the sash which clears said stops, of guide-bars arranged in said guideways and each bearing with one of its inner corners against a rabbet on the adjacent guide-stop and provided near its di-
40 agonally opposite corner with a tongue which engages with a groove in the sash, and pivots connecting said guide-bars and sash, substantially as set forth.

4. The combination with the window-frame
45 provided with a guideway, a guide-bar arranged in said way and a sash engaging with said bar, of a plate arranged on the guide-bar and provided with a bearing, a plate arranged on the sash and provided with a trunnion
50 turning in said bearing, a tension-bolt arranged in said trunnion and provided at one end with a head engaging with the back of the plate on the guide-bar, and a spring arranged on the sash and connected with the
55 opposite end of the tension-bolt, substantially as set forth.

5. The combination with a window-frame provided with a guideway, a guide-bar arranged in said way and a sash engaging with
60 said bar, of a plate arranged on the guide-bar and provided with a bearing, a plate arranged on the sash and provided with a trunnion turning in said bearing, a tension-bolt arranged in said trunnion and provided at one
65 end with a head bearing against the back of the plate on the guide-bar, and a bow-spring provided at its ends with notches which en-

gage with lugs on the back of the plate on the sash and connected with its central portion to the opposite end of said bolt, substantially
70 as set forth.

6. The combination with a window-frame provided with a guideway, a guide-bar arranged in said way, and a sash pivoted on
75 said bar, of a shoulder arranged on one of said plates and engaging with a shoulder on the other plate when the sash is in its normal position, substantially as set forth.

7. The combination with a window-frame provided with a guideway, a guide-bar arranged in said way and provided with a
80 tongue, and a sash provided with a groove which receives said tongue, of plates secured, respectively, on said bar and sash, a trunnion arranged on the plate secured to the sash and
85 turning in a bearing in the plate secured to the bar, a tension-bolt arranged in the trunnion and yieldingly connecting said plates, and a segmental lug arranged concentrically on the plate secured to the sash and engaging with a
90 segmental groove formed in the plate secured to the bar, substantially as set forth.

8. The combination with a window-frame provided with a guideway, a guide-bar arranged in said way and provided with a
95 tongue, and a sash provided with a groove which receives said tongue, of a convex plate secured to said guide-bar and provided with a bayonet-slot, a concave plate secured to said sash and engaging the convex plate, a pivot
100 connecting said plates and arranged in said slot, and a guard-lug arranged on the convex plate and fitting in said slot, substantially as set forth.

9. The combination with a window-frame
105 provided with a guideway, a guide-bar arranged in said way and provided with a tongue, and a sash provided with a groove which receives said tongue, of plates secured to said sash and bar, a pivot connecting said
110 plates, a lug arranged on one of said plates and engaging with a groove in the other plate, and a web arranged across said groove and engaging with a recess in said lug, substantially
115 as set forth.

10. The combination with a window-frame provided with a guideway, a guide-bar arranged in said way and provided with a
120 tongue, and a sash pivoted on said bar and provided with a groove which receives said tongue, of interlocking convex and concave plates secured, respectively, to said bar and sash, a segmental lug arranged concentrically on the concave plate, and engaging with a cor-
125 responding groove in the convex plate, and a web arranged across said groove and engaging with a recess in said lug, substantially as set forth.

11. The combination with a window-frame provided with a guideway, a guide-bar mov-
130 able longitudinally and laterally in said guideway and a sash connected with said guide-bar, of a stop arranged in said guideway in rear of the longitudinal path of the guide-bar and

adapted to hold the guide-bar against lateral movement toward the back of said guideway when the guide-bar is arranged in front of said stop, substantially as set forth.

5 12. The combination with a window-frame provided with a guideway, a guide-bar provided on its outer side with a tongue and capable of a longitudinally-sliding and a transversely-swinging movement in said guideway,
10 of a sash provided with a groove which receives the tongue of the guide-bar, a pivot connecting the sash and guide-bar, and a stop arranged in said guideway in rear of the longitudinal path of the guide-bar and adapted
15 to hold the guide-bar against swinging backwardly when the same is arranged in front of said stop, substantially as set forth.

13. The combination with a window-frame provided with a guideway having a continuous bearing-face along its outer edge and a recess arranged inwardly from the continuous face, of a guide-bar movable longitudinally and transversely in said way, a sash connected with said bar, and a catch arranged
25 on said bar and adapted to engage with said continuous face of the guideway when in its outer projected position and to engage with said recess when in its inner retracted position, substantially as set forth.

30 14. The combination with a window-frame provided with two guide-stops which form a guideway and one of which is provided along its outer longitudinal edge with a continuous bearing-face and inwardly from said face with
35 a recess having an inwardly-facing shoulder on its outer side, a downwardly-facing shoulder on its upper side and an inclined back, of a guide-bar sliding longitudinally in said way and pivoted with one of its longitudinal edges
40 adjacent to one of said guide-stops and movable transversely with its opposite free end with reference to the other guide-stop having the continuous face and recess, a sash detachably connected with the guide-bar, and a catch
45 pivoted on the free edge of the guide-bar and adapted to engage either with said continuous face or with said recess, substantially as set forth.

50 15. The combination with a window-frame provided with a guideway, of a guide-bar capable of sliding lengthwise and turning transversely in said guideway, a sash connected with said guide-bar, and a weather-strip of flexible sheet metal which forms a pivot between the guide-bar and guideway and which
55 extends with one edge along the side of the

guide-bar and is secured thereto, so as to move therewith, while its other edge slides in a groove or slit in the guideway, substantially as set forth. 60

16. The combination with a window-frame provided with a guide, a guide-bar capable of turning transversely in said guide and sliding lengthwise therein, and a sash connected with said bar, of a weather-strip of angular
65 form having one of its flanges arranged in a slit in said guide and its other flange arranged in a slit in said bar and provided at its upper end with a shoulder and at its lower end with a slot, and fastenings secured to the bar and
70 engaging with said shoulder and slot of the weather-strip, substantially as set forth.

17. The combination with a window-frame provided with guide-stops, guide-bars arranged between said stops, and sashes connected with said bars and provided with meeting-rails, of weather-pawls arranged between
75 said guide-bars adjacent to the meeting-rails when the sashes are closed and pivoted to the adjacent guide-stops, substantially as set forth. 80

18. The combination with a window-frame provided with guide-stops, guide-bars arranged between said stops, and sashes connected with said bars and provided with meeting-rails, of weather-pawls arranged between
85 the guide-bars adjacent to said meeting-rails when the sashes are closed and pivoted to the adjacent guide-stops, each pawl having an upwardly-projecting arm bearing against
90 one guide-bar and a downwardly-projecting arm bearing against the other guide-bar, substantially as set forth.

19. The combination with a window-frame provided with guide-stops, guide-bars arranged between said stops, and sashes connected with said bars and provided with meeting-rails, of weather-pawls arranged between
95 the guide-bars adjacent to the meeting-rails when the sashes are closed and pivoted to the adjacent guide-stops, each pawl having an upwardly-projected weighted or heavy arm which bears against one of said guide-bars and a downwardly-projecting light arm which
100 bears against the other guide-bar, substantially as set forth. 105

Witness my hand this 18th day of October, 1899.

CLINTON D. TABOR.

Witnesses:

D. N. BESSER,
JACOB RAMSBERGER.