

No. 834,968.

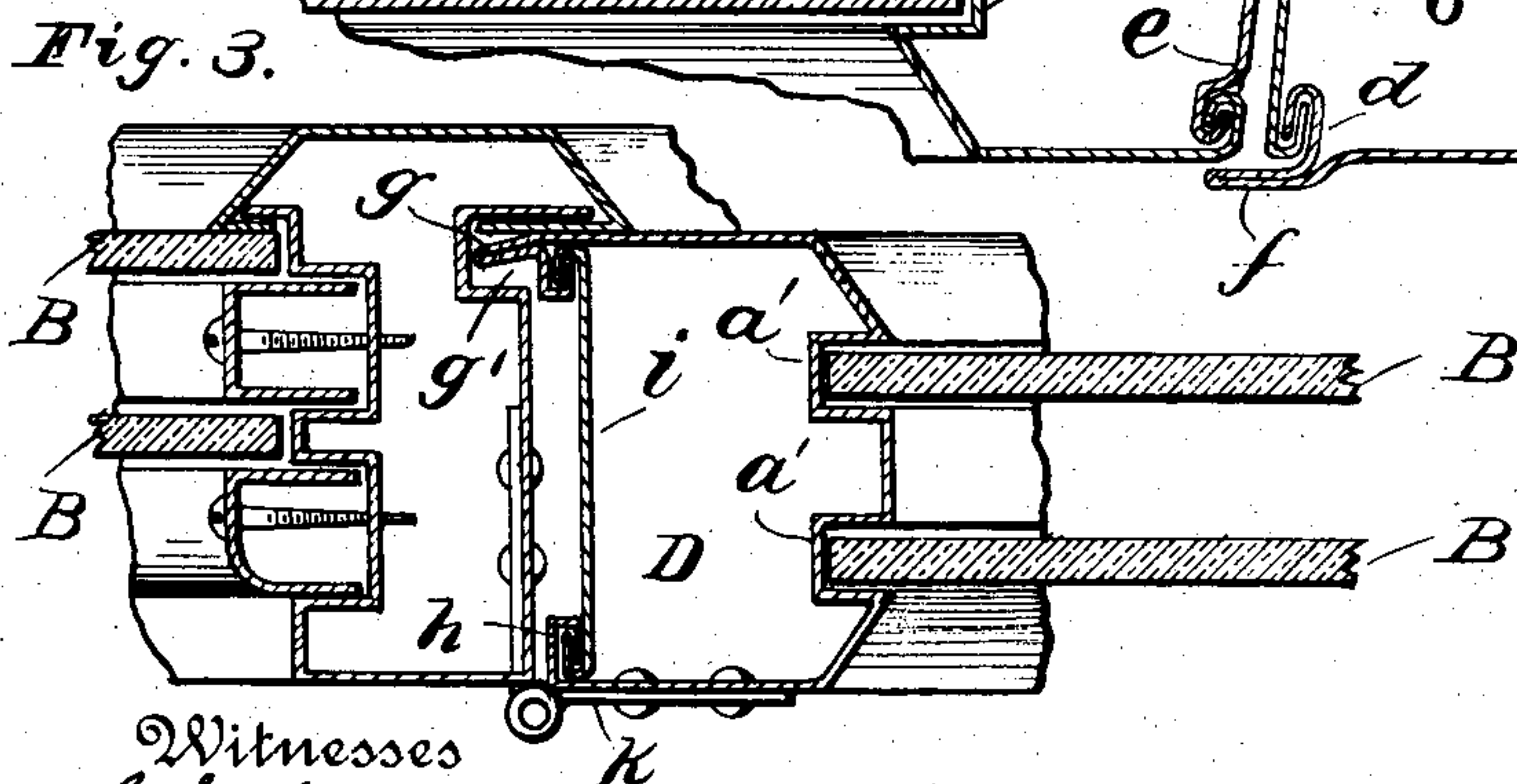
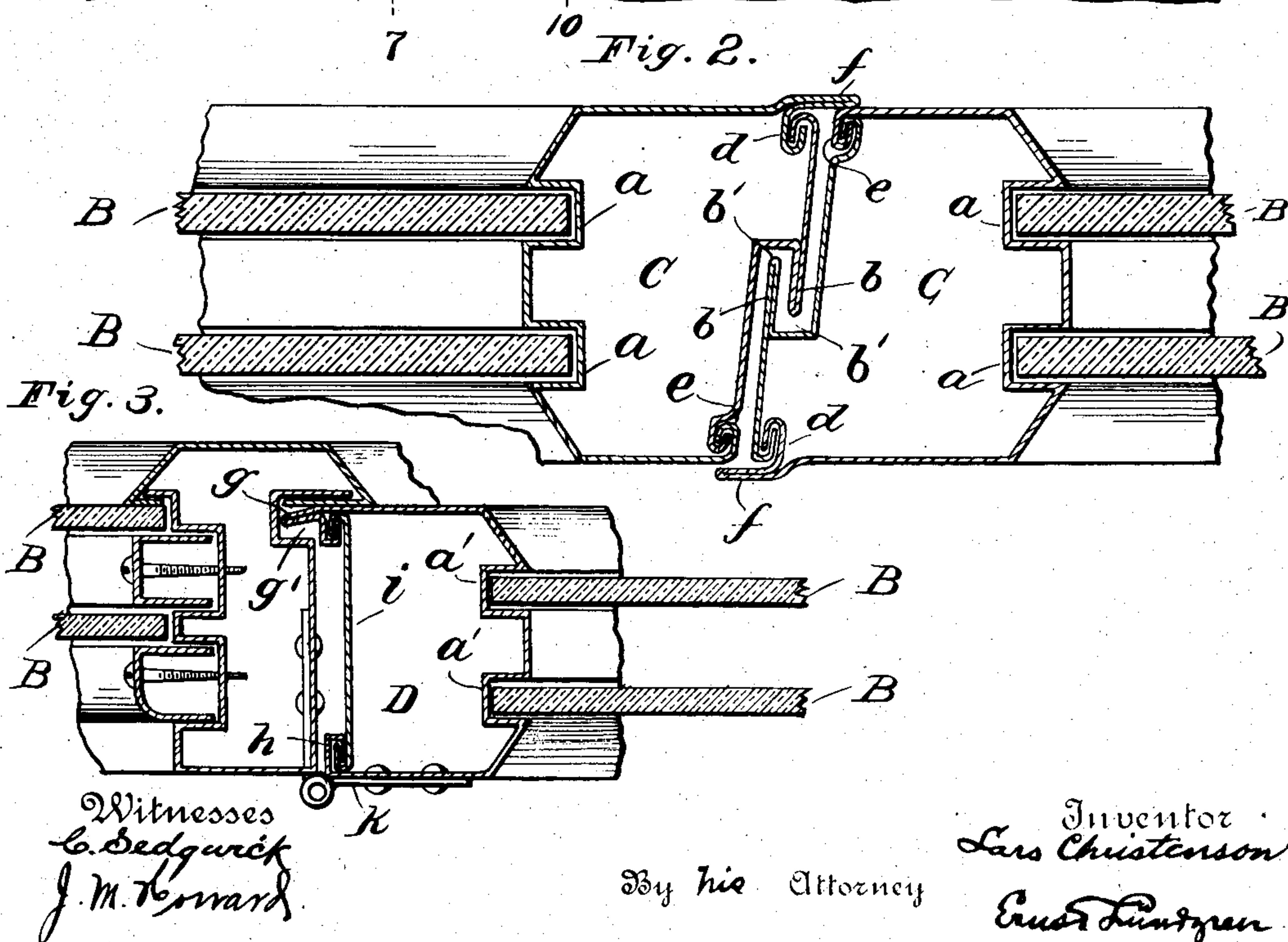
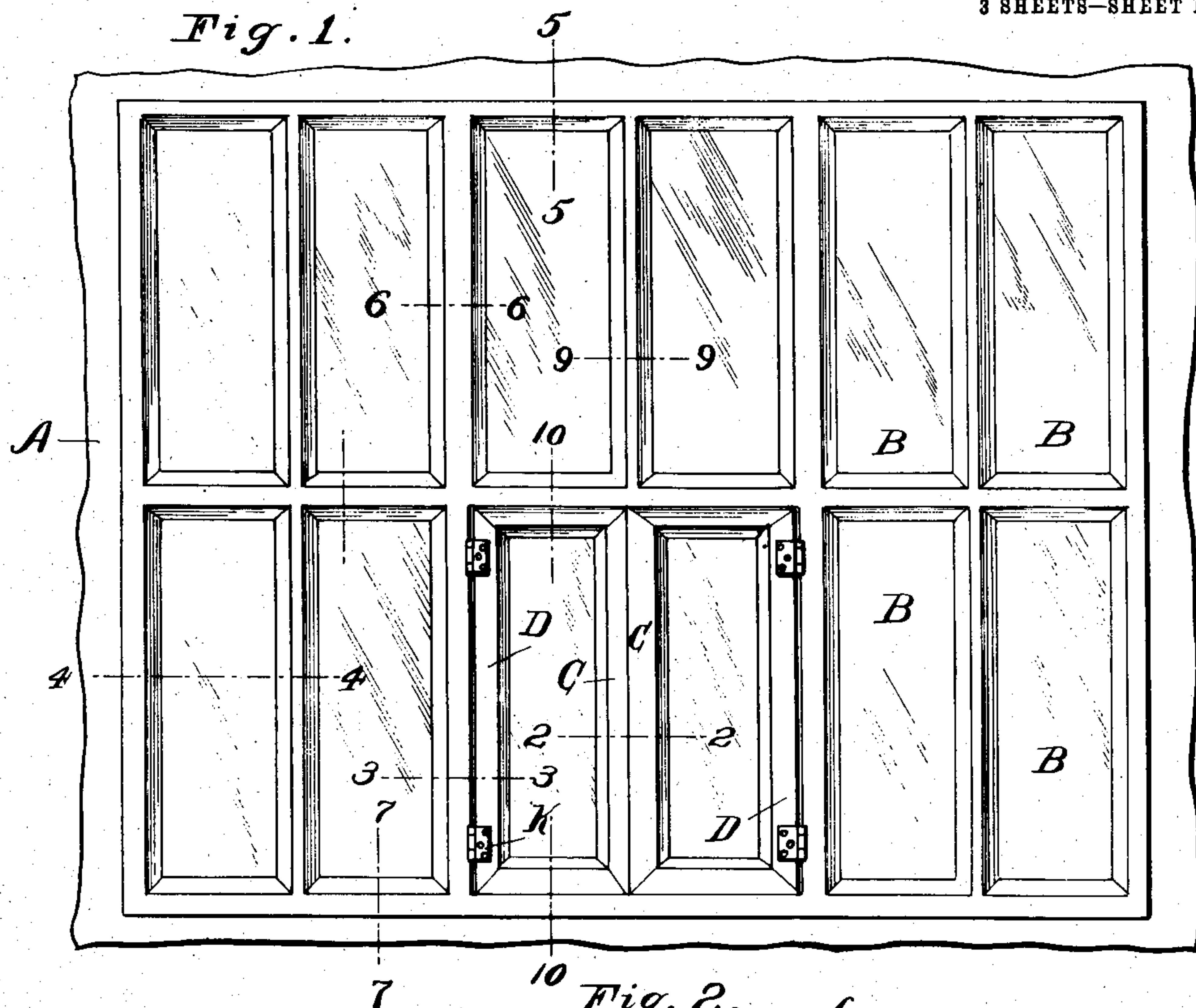
PATENTED NOV. 6, 1906.

L. CHRISTENSON.

HOLLOW FIREPROOF DOUBLE GLAZED WINDOW.

APPLICATION FILED NOV. 15, 1905.

3 SHEETS—SHEET 1.



Witnesses
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J. M. Howard

By his Attorney

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3 SHEETS—SHEET 2.

Fig. 4.

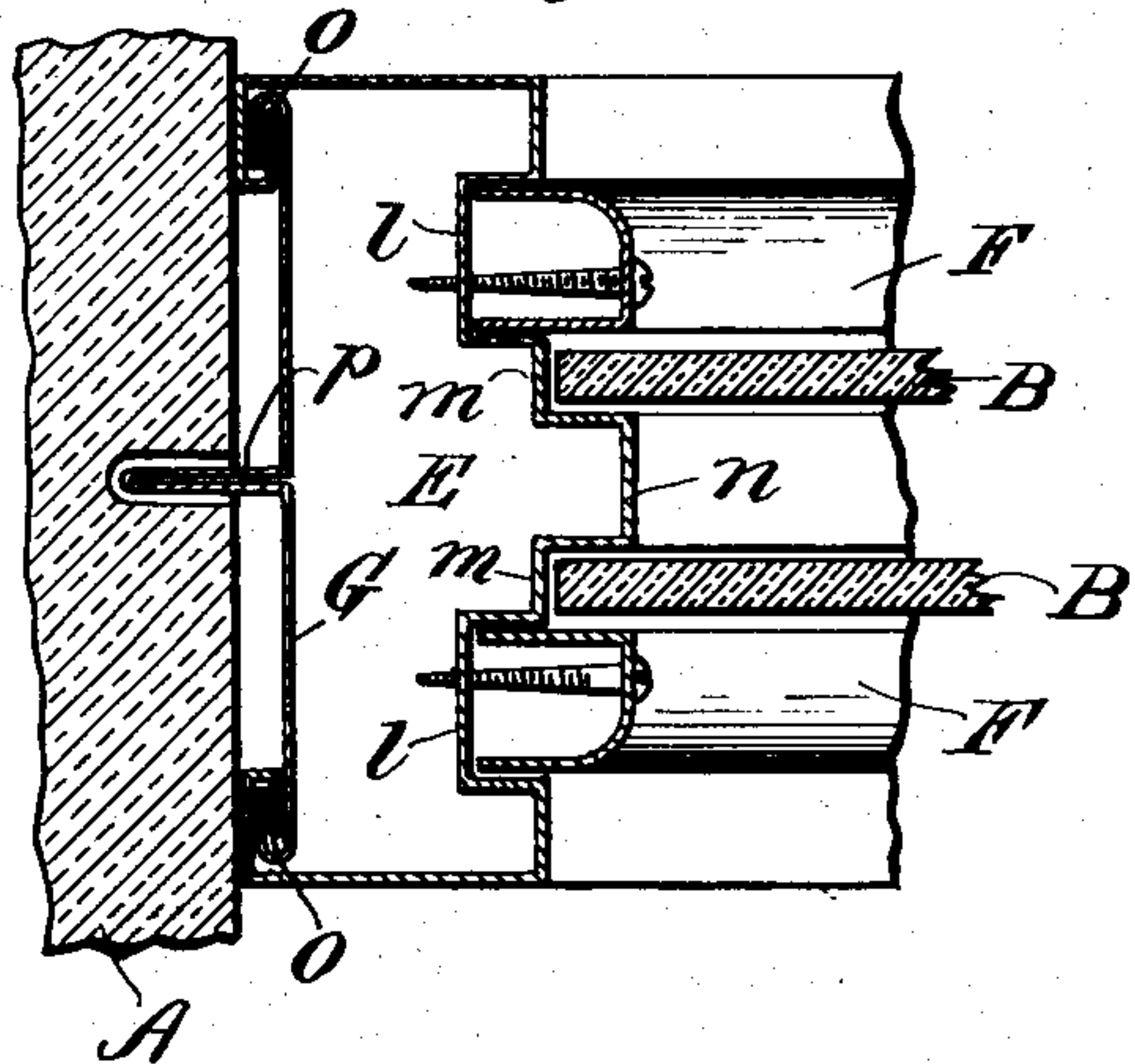


Fig. 5.

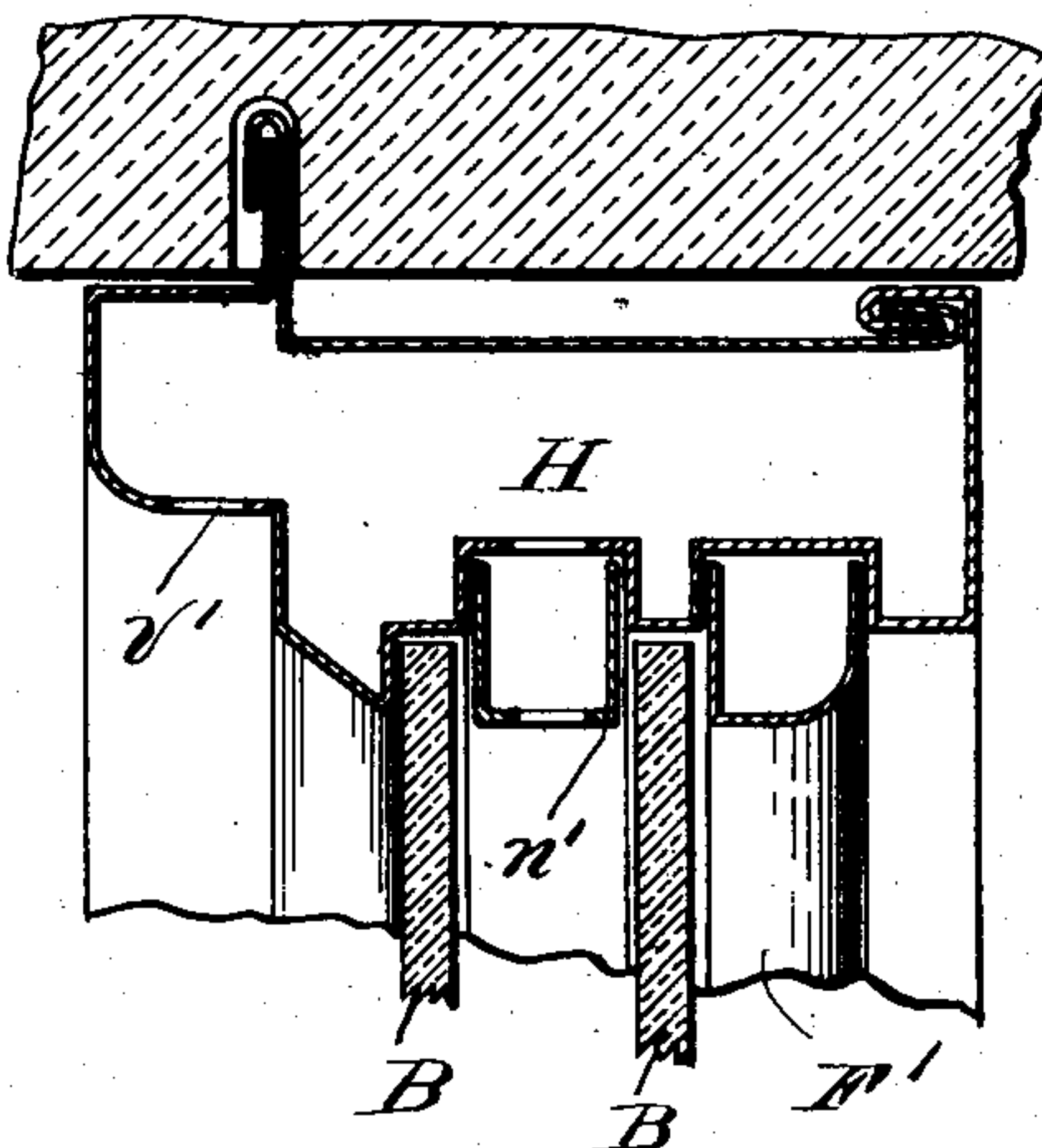


Fig. 6.

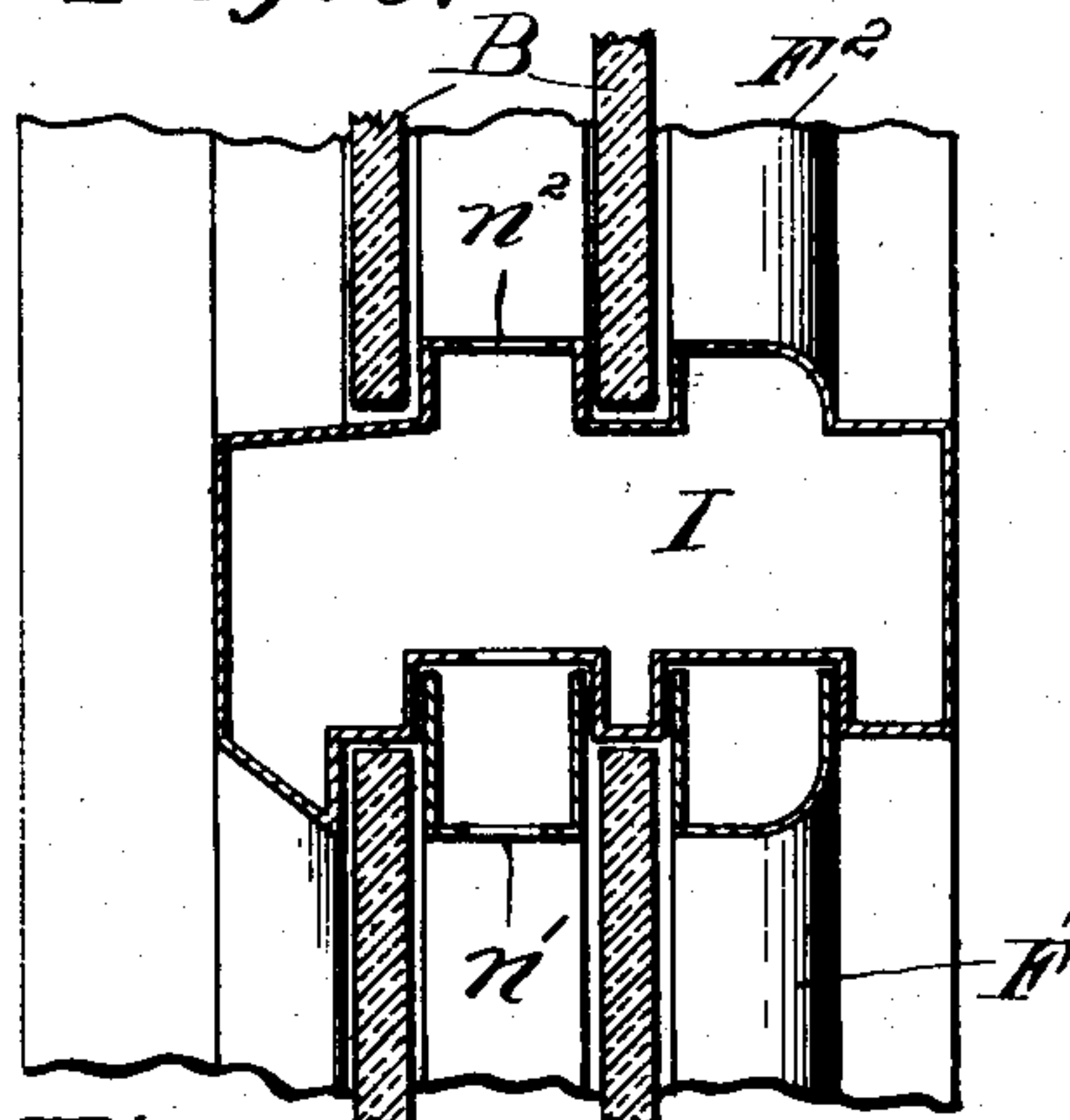
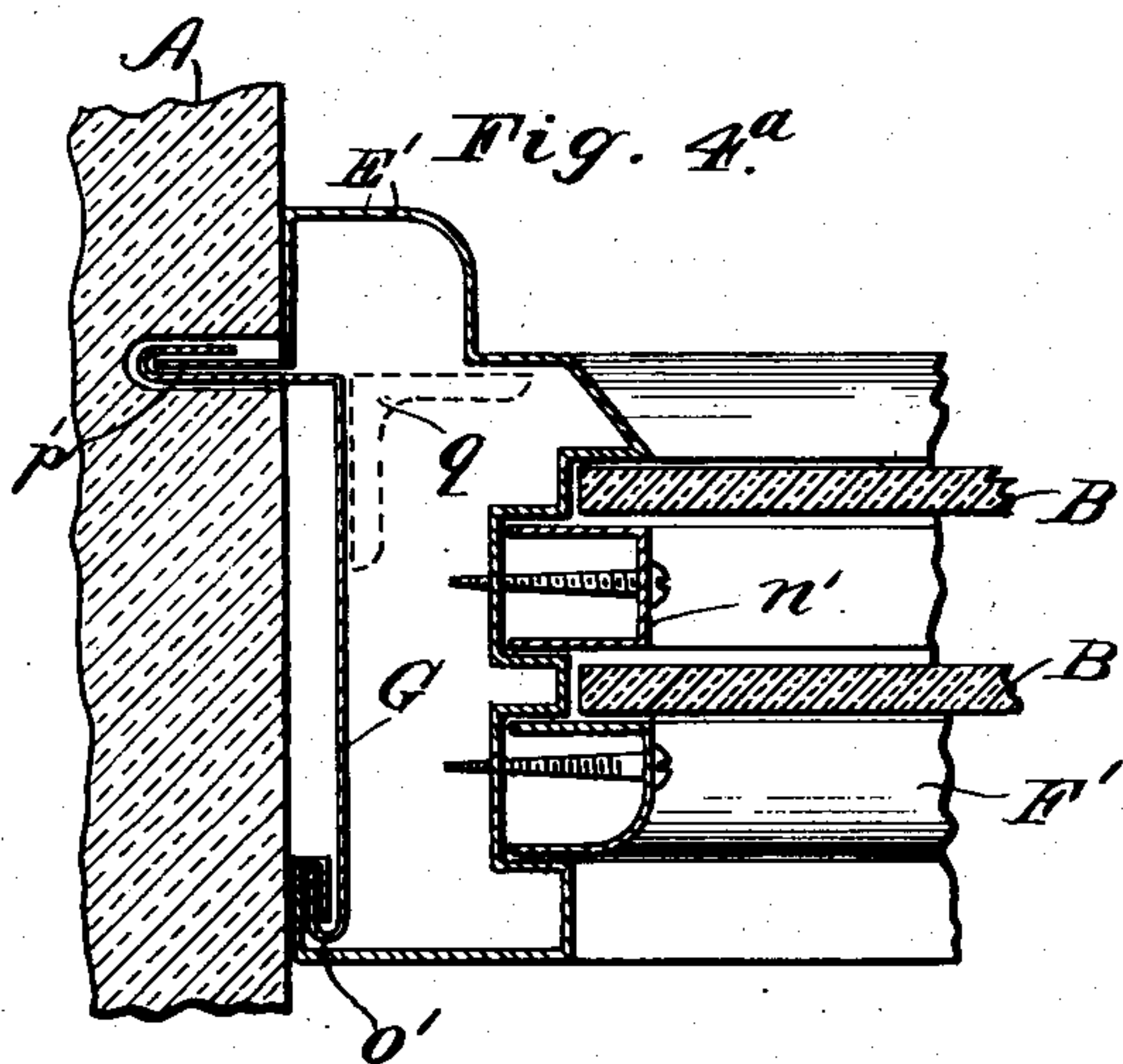
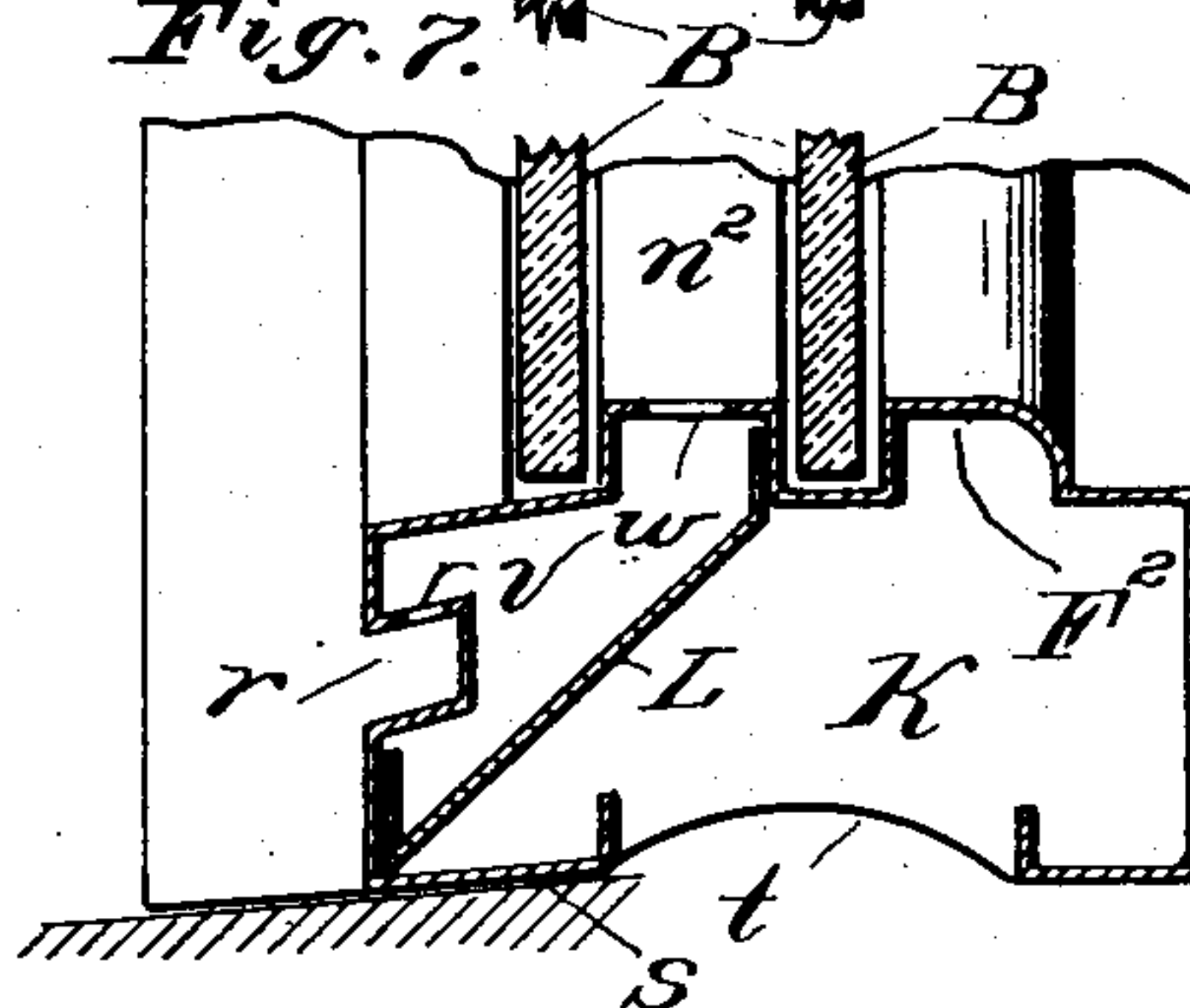


Fig. 7.



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3 SHEETS—SHEET 3.

Fig. 8.

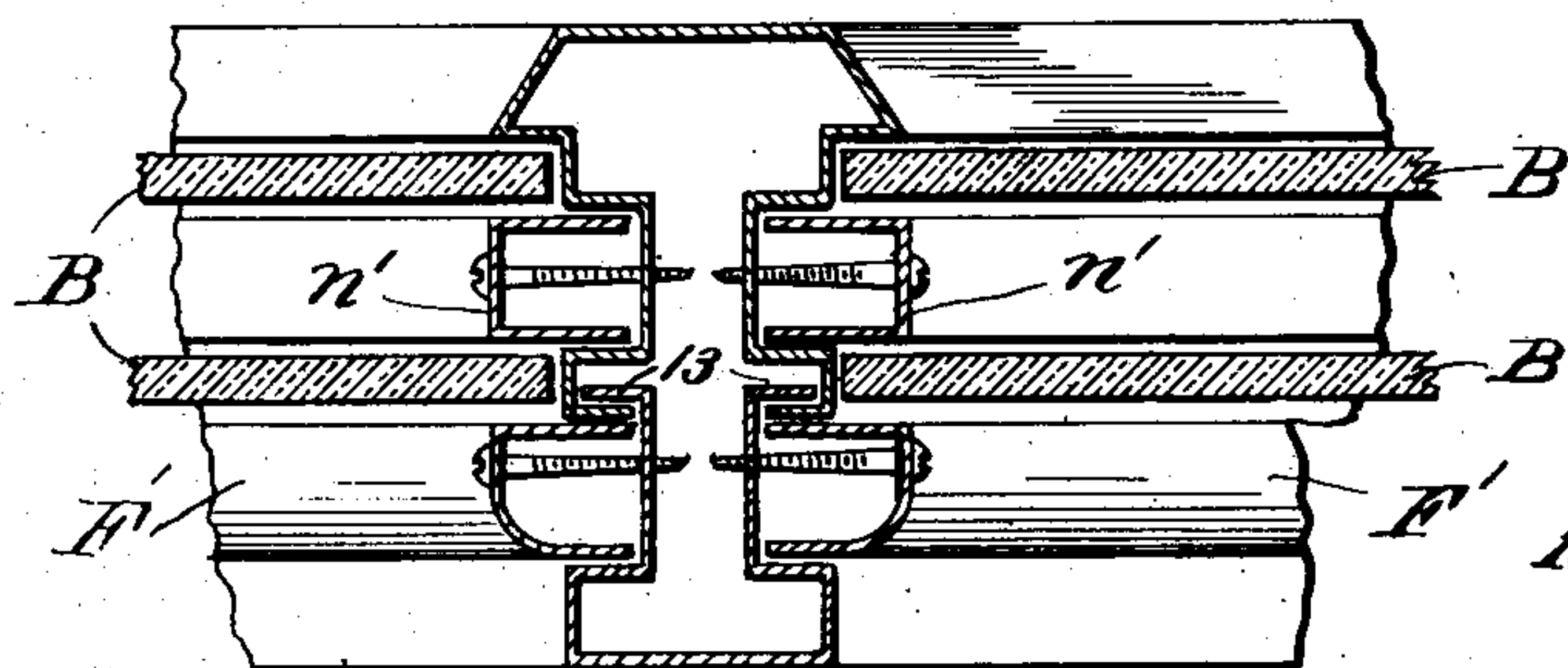


Fig. 9.

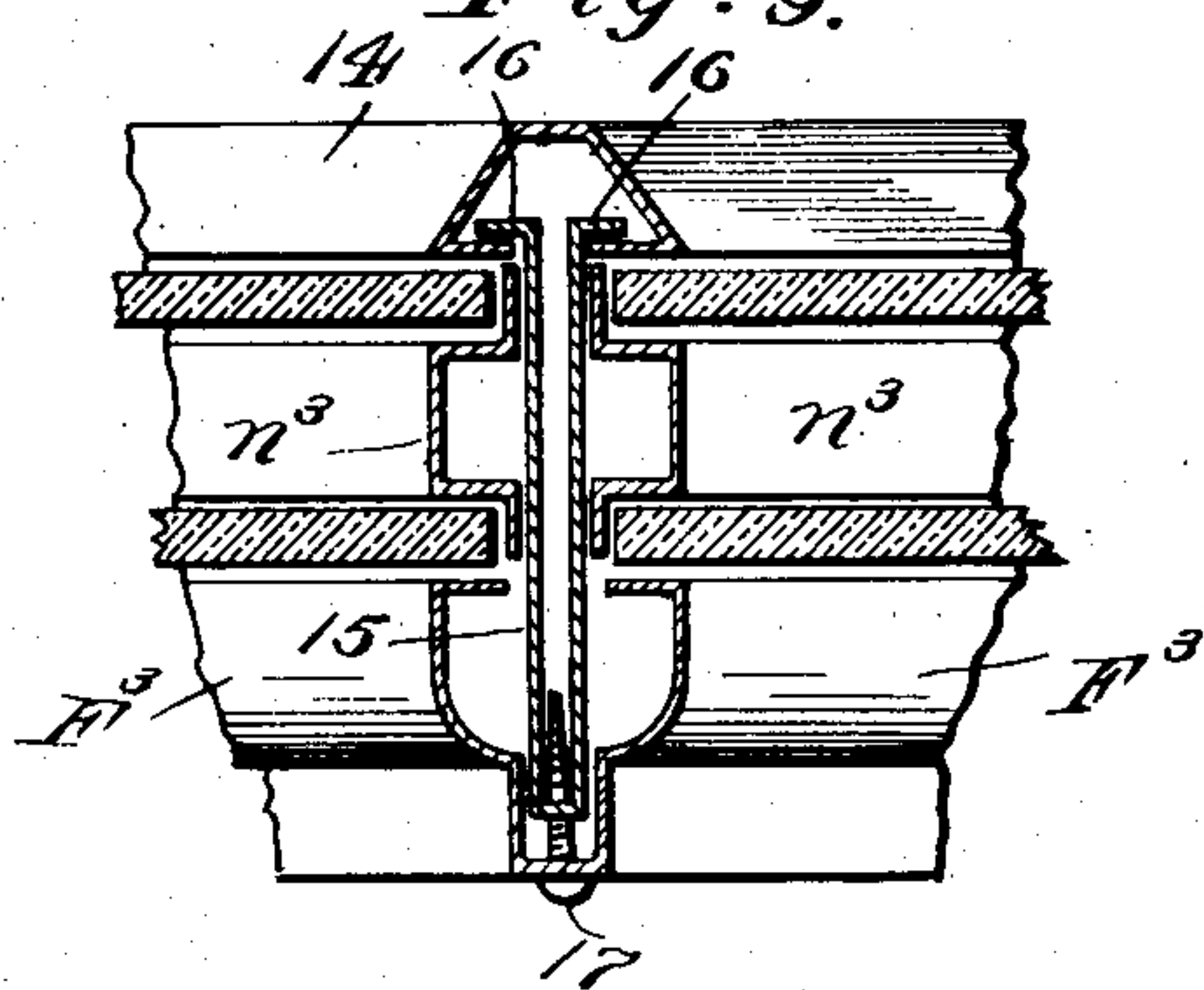


Fig. 11.

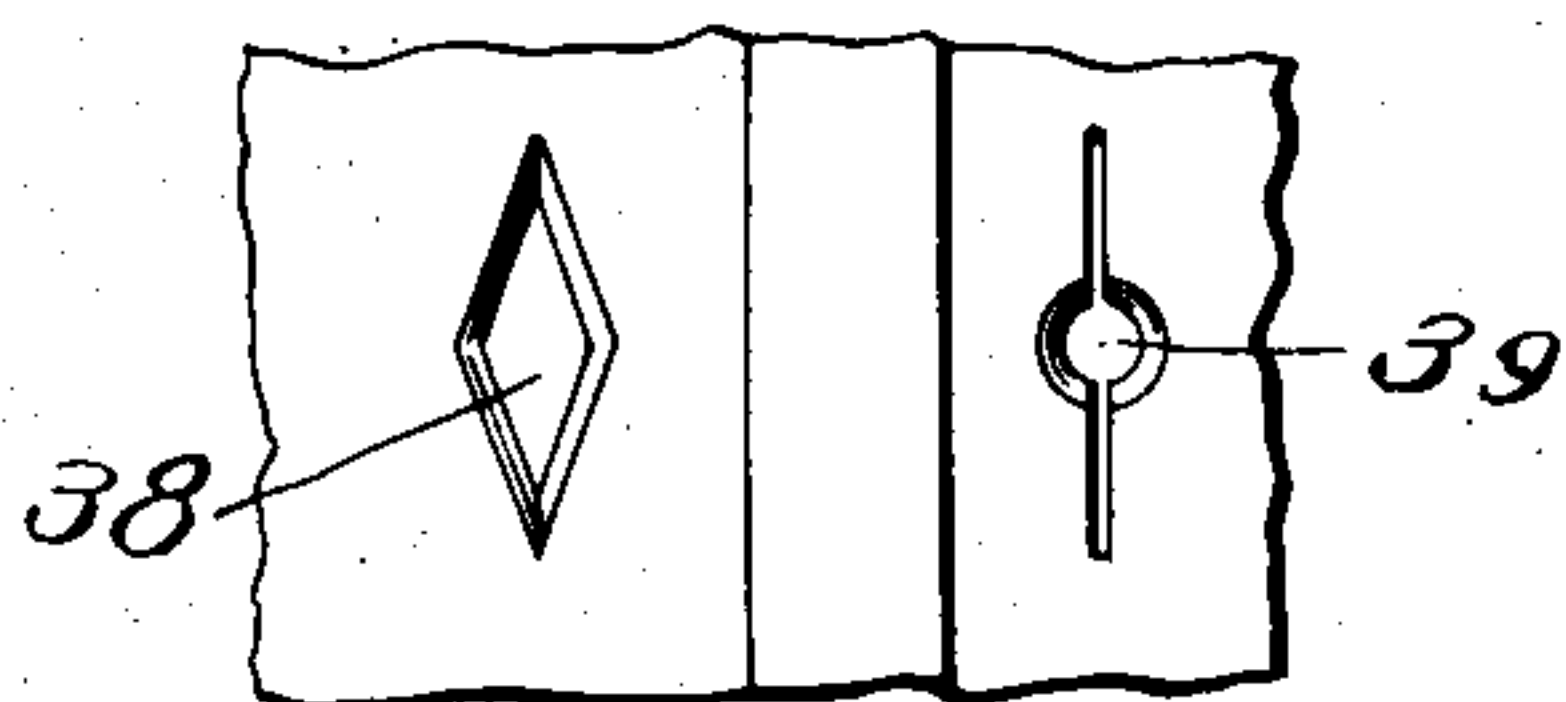


Fig. 12.

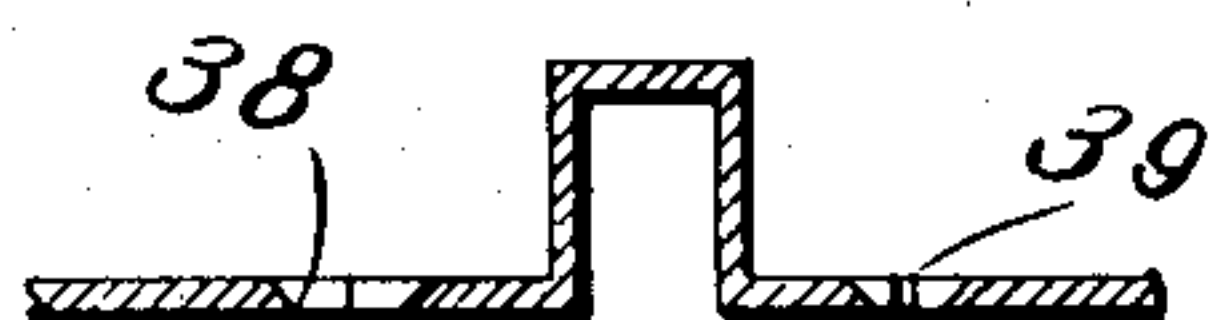
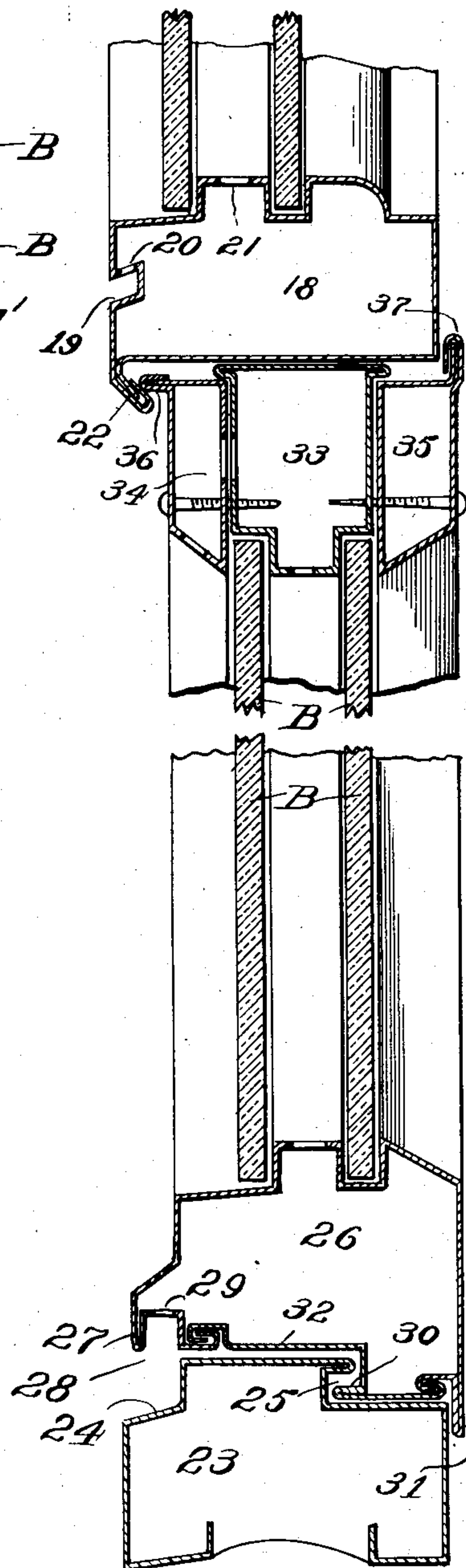


Fig. 10.



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UNITED STATES PATENT OFFICE.

LARS CHRISTENSON, OF NEW YORK, N. Y.

HOLLOW FIREPROOF DOUBLE-GLAZED WINDOW.

No. 834,968.

Specification of Letters Patent.

Patented Nov. 6, 1906.

Application filed November 15, 1905. Serial No. 287,412.

To all whom it may concern:

Be it known that I, LARS CHRISTENSON, a citizen of the United States, residing at the borough of Bronx, city of New York, county of New York, and State of New York, have invented certain new and useful Improvements in Hollow Fireproof Double-Glazed Windows, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact specification.

This invention has relation to that class of windows wherein the rails and stiles are made of sheet metal, and particularly to the form wherein double glazing or double lights are employed.

The principal objects of my invention are to provide or produce a strong, durable, and reliable window of the class named, which may be easily and cheaply manufactured and conveniently and securely mounted in place for use in a wall or partition wherein it will afford the desired lighting and fireproof capacities, ample provision being made for ventilating the spaces between the glass and in the interior of the sheet-metal portions, the window being made up of several distinct panes or panels.

To accomplish these objects and to secure other and further advantages in the matters of construction, operation, application, and use, my improvements involve certain new and useful peculiarities of construction and relative arrangements or combinations of parts, as will be herein first fully described and then pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a front elevation of a window constructed and arranged for operation in accordance with my invention and involving my improvements, the same being shown as including several fixed panes or panels and a double-hinged section incorporated in the window, the window being represented as finally mounted in place in a wall or partition. Fig. 2 is a horizontal sectional view on a plane through the line 2 2 of Fig. 1, the scale being enlarged beyond that of the previous figure. Fig. 3 is a horizontal sectional view on a plane through line 3 3. Fig. 4 is a similar view at the line 4 4; and Fig. 4^a is a similar view at the same point, but showing a slightly-modified form of construction of the end window-stile. Fig. 5 is a vertical view on a plane through line 5 5 of Fig. 1. Fig. 6 is a similar view at the line 6 6, and Fig. 7 a similar view at the

line 7 7. Fig. 8 is a horizontal view on a plane through the line 8 8 of Fig. 1, and Fig. 9 is a similar view at the line 9 9. Fig. 10 is a vertical section and elevation on a plane through line 10 10 of Fig. 1 looking toward the right of that figure, showing the construction and arrangement of the upper and lower portions of one of the hinged doors, the cross-rail above, and the sill below. Fig. 11 is a front elevation of a fragment, and Fig. 12 a horizontal section of the same, showing the manner of perforating the parts to receive the ends of the wood-screws where they are employed for uniting or coupling the various parts.

In all the figures like reference characters, wherever they occur, indicate corresponding parts.

The window may be made up of panes or panels of any desired number and of any required size, and the panes may be arranged in the window as may be desired, following the general principles of construction herein referred to. The improved window is intended to be mounted in any wall or partition of masonry or other character which is represented at A. When the window is employed in an exterior wall, as it may be, the exterior portion is preferably made so that the panes are not removable from the exterior; but when it is employed in an interior partition it is preferred to make both faces of the window of similar construction, because both faces are then equally accessible, and the two faces may be advantageously made alike.

B B represent the glass panes, which are secured in the window and which may be of any character. I prefer to employ what is commonly known as "wired" glass, the same affording a better protection against the effects of fire; but plain or other glass without the wire may be employed, if so desired. The panes are double throughout the window, and they are separated by a suitable distance, depending upon the width of the strip or stop employed between them.

As the window itself is intended to be permanently fixed in the wall or partition it is desirable to hinge one or more of the panels so that an opening may be obtained through the window for ventilation and other purposes. While the hinged portion may be made of a single panel, I have chosen to illustrate two adjacent panels hinged so that they will close one against the other, making a double door through the structure.

C C represent the vertical adjacent stiles of the two hinged portions. These are formed of sheet metal suitably bent so as to provide channels for receiving glass, as at *a a*, and the vertical adjacent faces of these stiles are slightly inclined with respect to the front faces and at their central parts are bent or doubled back on each other, as at *b b*, and their margins interlocked or beaded with the bent portions *d d* and *e e* of the vertical exterior or front and back faces. It will be observed that the doubled portion *b* on one part enters a corresponding recess *b'* in the other part and that the doubled portion *f* on each part laps a trifle beyond the margin of the adjacent face. The effect of this is to insure a close joint between these two hinged portions of the window to prevent the passage of air or a draft between them and to insure that the necessary swinging of one hinged portion will not be impeded by the other. Further, it will be observed that the construction is such as to make the meeting faces of the hinged portions alike, which simplifies and cheapens the manufacture.

The metallic pieces are rolled or bent and fashioned of sheet metal by suitable machinery and in strips of any desired length, to be afterward cut and assembled.

The construction of one of the hinged stiles D is illustrated in Fig. 3. These stiles are provided with recesses, as *a' a'*, to receive the glass, and their front and back faces are bent and doubled, as at *g* and *h*, and interlocked or beaded with a vertical piece, as *i*. One of the hinge-plates *k* is riveted to the exterior face substantially as indicated, and the other hinge-plate is riveted to the vertical interior face of the adjacent stationary stile, in which latter there is a recess *g'* to receive the doubled portion *g*. The door swings on its hinges, the doubled portion *g* being suitably bent, so as to clear the adjacent portion of the stile on which the door is hung. It will be seen that one portion of the adjacent stationary stile reaches beyond the corresponding face of the door and that the arrangement is such as to prevent a draft or current of air between the hinged door and the adjacent stationary stile. When the double doors are employed, the hinged stiles are similarly made, although oppositely located, and this for obvious advantages in the manufacture.

In Fig. 4 the two faces of the window are shown as of similar construction. E represents the end stile, the same being composed of two pieces of sheet metal. The main portion of this stile is bent, as at *l l*, to form recesses for receiving the stops F F and at *m* to form angles within which the panes B B are seated and retained in place by the stops F F. This portion is also angularly bent, as at *n*, to form a parting-strip between the two panes, the same determining the distance of

the panes from each other and supplying the interior ledges against which the panes abut. The interior and exterior faces of the stile are carried back and beaded, as at *o o*, with the end strip or plate G. The latter is doubled, as at *p*, at or near its central part to form a projecting flange which is intended to be embedded in the material of the wall or partition and to furnish a secure anchor for the window. Under this construction the stops F F may be removed and the panes inserted from either side of the frame or window. This construction is principally intended for use in inside work.

For exterior windows it is preferred that the panes shall be inserted and removed from the inside of the window only, and the construction shown in Fig. 4^a provides for this. In this form the parting-strip *n'* is made removable, and the panes are secured in place by this strip and by a single removable stop F', which may be the same as the stop F in the previous figure. The main portion of the stile in this form is preferably bent outward, as at *E'*, to form a marginal weather-molding, and it is then carried back and jointed with the back plate G', as at *p'*, to form a projecting flange for entering the masonry or other material of the wall, and this back plate is beaded with the main portion, as at *o'*. In this construction in order to stiffen the stile it may be desirable to employ interior angular strips, as indicated by the dotted lines at *q*, although if the metal of the window be sufficiently stiff this bracing may be omitted.

In Fig. 5 the top rail is indicated at H, and it is shown as formed to correspond with the construction shown in Fig. 4^a, the removable parting-strip *n'* and the removable stop F' being continued. The general form of the top rail is merely a continuation of the end stile, and so far as its outline is concerned it need not be more specifically described. Instead of being made to correspond with Fig. 4^a it might be made on the lines indicated in Fig. 4.

A corresponding interior horizontal rail is shown in detail at I in Fig. 6, a removable stop F' and removable parting-strip *n'* being employed on the under side of this rail and the under side being bent to form angles and recesses of the same general character as those in the lower face of the top rail. The upper part is, however, bent to form a stationary stop F² and a stationary parting-strip *n*², it being unnecessary to provide removable strips or stops on one margin of the panel, for the panes may be inserted at one edge in the grooves or channels provided for them and afterward secured at the other three margins. The rail so formed is easily made in one piece.

K, Fig. 7, represents the lower horizontal window-rail except the portion which constitutes the sill for the hinged doors, and this

also is conveniently made in one piece, as shown. Its top face is bent to form the stationary stop F^2 and the stationary parting-strip n^2 , corresponding with the upper face of one of the interior horizontal rails. Its interior front face is plain; but the exterior front is recessed, as at r , and its bottom is preferably inclined slightly, as at s , so as to form a proper seating on the wall and provided with openings, as at t , which openings will admit a portion of the material of the wall to assist in anchoring the window.

Interior braces for the lower rail may be supplied whenever necessary. L represents such a brace, the same extending from one corner up to the wall of the channel for the inner glass and serving to stiffen the structure in a manner which will be apparent.

It is desirable to provide for a circulation of air through the metallic parts and between the panes of glass to insure against overheating and consequent damage, which may be unnecessary. I therefore perforate the material of the lower rail, as at v and w , at suitable intervals, which perforations will admit air from the exterior. A current of air passes up through the hollow metallic portions and out at corresponding perforations in the top rail, as at v' . A portion of the air-current in the lower rail will enter between the double panes, pass up through suitable perforations which are provided for the purpose, and finally enter the top rail and escape therefrom through the perforations v' .

The construction of the larger interior stationary stiles is represented in Fig. 8 and of the smaller in Fig. 9. These stiles are so constructed that they will join with the horizontal rails above and below them and present a harmonious appearance with those rails. In the form shown in Fig. 8 the stile is composed of two parts, the projecting margins of one part entering recesses in the other, as shown at 13 13, the same form of removable parting-strips n' and of removable stops F' being employed as in previous figures and the parts of the stile being bent to form angles and recesses to accommodate the panes and other parts, as explained with reference to previous figures.

In Fig. 9 the parting-strips n^3 are held in place by the panes, and the removable stops F^3 F^3 are made continuous with the upright member and held in place by a peculiar fastening. The exterior or weather molding 14 has interior ledges on each side, and a separate piece 15, made by doubling a strip of sheet metal, has exterior flanges 16 16, which engage the interior ledges on the weather-molding, as indicated. A removable screw, as 17, passes through the bridge, which unites the stops F^3 F^3 and enters the interior piece 15. When the screw 17 is tightened or finally seated, it draws all the parts to their proper location and holds them securely in place.

18 represents that portion of the horizontal rail which is located above the opening closed by the doors. (See Fig. 10.) Its upper surface corresponds with the remainder of the horizontal rail; but its outer face is preferably recessed, as at 19, and in this recess is a small perforation, as at 20, to provide for the entrance of a current of air which passes between the upper panes through a perforation, as at 21. This portion of the rail is preferably made of a continuous piece properly bent and having its margins beaded together or interlocked, as at 22, where the interlocked parts are bent down to form a stop for the door to close against.

The door-sill 23 corresponds with the lower part of the lower window-rail, being bent on the exterior to form an angle 24 and on the top to form a recess 25. The lower rail of the door 26 is fashioned to correspond somewhat with the upper part of the lower window-rail, but having a downwardly-projecting part 27, which, together with the sill, forms a recess 28. Air enters this recess and passes up through a perforation 29 into the hollow door-frame between the panes and out at the top through suitable perforations provided in the upper rail of the door-frame. The bottom plate of the lower rail 26 is bent to form a projection 30, which enters the recess 25, and the inner face of this lower rail extends down, as at 31, to close against the adjacent face of the sill, and it is then bent back and interlocked with the margins of the plate 32, which forms the bottom of the lower rail of the door-frame.

The upper rail of the door-frame is composed of a central piece 33 and outside applied moldings 34 and 35, each preferably made of a single piece of sheet metal. The top of the piece 33 is bent or doubled to form slight angles for the reception of the moldings 34 and 35, and the bottom is bent so as to form the parting-strip between the two panes. The moldings 34 and 35 secure the two panes in place, the upper part of the molding 34 being made to project horizontally, as at 36, to strike against the portion 22 of the part 18. The outside face of the molding 35 is carried up and bent, as at 37, and located so as to project beyond the lower face of the part 18. The projections 36 and 37 operate to stop the door at the proper position when it is closed and prevent a draft of air from passing between the top of the door and its casing, as is desirable, to exclude dust and to secure a proper fitting of the door.

The perforations in the piece 33 and the molding 34 permit the circulation of air from between the panes to the exterior, as will be readily understood.

The applied parts of the metallic framing for the doors and window-panels are secured in place by ordinary wood-screws, as indicated in Figs. 3, 4, 4^a, 8, and 9. These screws

are made to hold well and to be easily applied at the desired points by making a small perforation or narrow slit through the metallic piece into which their points are to enter. In Figs. 11 and 12 I have illustrated two forms of these slits or openings which may be made for the purpose. At 38 the opening is made in angular shape to receive the end of the screw, and at 39 a small circular opening, with straight slits extending therefrom, is shown.

The improved window being constructed and arranged substantially in accordance with the foregoing explanations is found to admirably answer all the purposes or objects of the invention hereinbefore alluded to.

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

1. In a window of the character herein set forth, a sheet-metal end stile adapted to receive and hold double panes, said stile being composed of plates suitably bent and interlocked at their margins, the exterior of the stile being formed to supply a flange for entering the adjacent wall, and a top rail similarly formed to receive the double panes and provided on its exterior with a projecting flange for entering the adjacent wall, the parts being combined and arranged substantially as explained.

2. In a window of the character herein set forth, a sheet-metal stile and a top rail adapted to receive and hold double panes, the inner face of said stile and of said top rail being bent to form channels and projections and the outer face of each being bent to form a flange for entering the adjacent wall, the same being combined with a parting-strip and stop-beads, substantially as shown and described.

3. In a window of the character herein set forth, a sheet-metal top rail adapted to receive and hold double panes, said rail being composed of plates suitably bent and interlocked at their margins, the exterior of the rail being formed to supply an upwardly-projecting flange for entering the wall, the parts being combined and arranged substantially as explained.

4. In a window of the character herein set forth, a sheet-metal top rail adapted to receive and hold double panes, the inner face of said rail being bent to form channels and projections and the exterior of the rail being bent to form a flange for entering the adjacent wall, the same being combined with a parting-strip and stop-beads, substantially as shown and described.

5. The herein-described top sheet-metal rail adapted to receive and hold double panes, the under face of said rail being bent to form channels and angular recesses for the panes on opposite sides of a central projection

which operates as a parting-strip, substantially as shown.

6. In a window of the character herein set forth, a sheet-metal rail adapted to receive and hold double panes above and below it, the upper and under faces of said rail being bent to form channels and angular recesses, the upper face having a projection forming a stationary parting-strip and the lower face having channels to receive a removable parting-strip and a removable stop-bead, substantially as shown.

7. The combination with the bottom sheet-metal window-rail adapted to receive and hold double panes of an interior brace extending from a lower corner up to the inwardly-extending channel for one of the panes, substantially as shown.

8. The bottom sheet-metal window-rail adapted to receive and hold double panes, the upper face of said rail being bent to supply a parting-strip and the outer face being bent inwardly to form a channel along said outer face, a wall of said channel being perforated and the parting-strip on the upper face being also perforated to provide for admission of air between the panes, substantially as set forth.

9. The bottom sheet-metal window-rail adapted to receive and hold double panes, the upper face of said rail being bent to supply a parting-strip, the outer face being bent inwardly to form a channel along said outer face, a wall of said channel and the parting-strip being perforated, the lower face of the rail having an inclined portion and being provided with an opening, and the inner face of the rail, all constructed and united substantially as and for the purposes set forth.

10. In a window of the character herein set forth, the combination of the two hinged doors having sheet-metal frames, the adjacent faces of the door-frames being bent to form recesses at their central parts and each door having a projection arranged to reach beyond the margin of the face of the other door, substantially as shown.

11. In a window of the character herein set forth, the combination of the top and bottom sheet-metal rails adapted to receive and hold double panes, the lower rail being perforated to admit air from the exterior between the panes, and the top rail and parting-strip thereon being perforated to permit escape of air from between the panes, substantially as shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LARS CHRISTENSON.

Witnesses:

C. SEDGWICK,
J. M. HOWARD.