

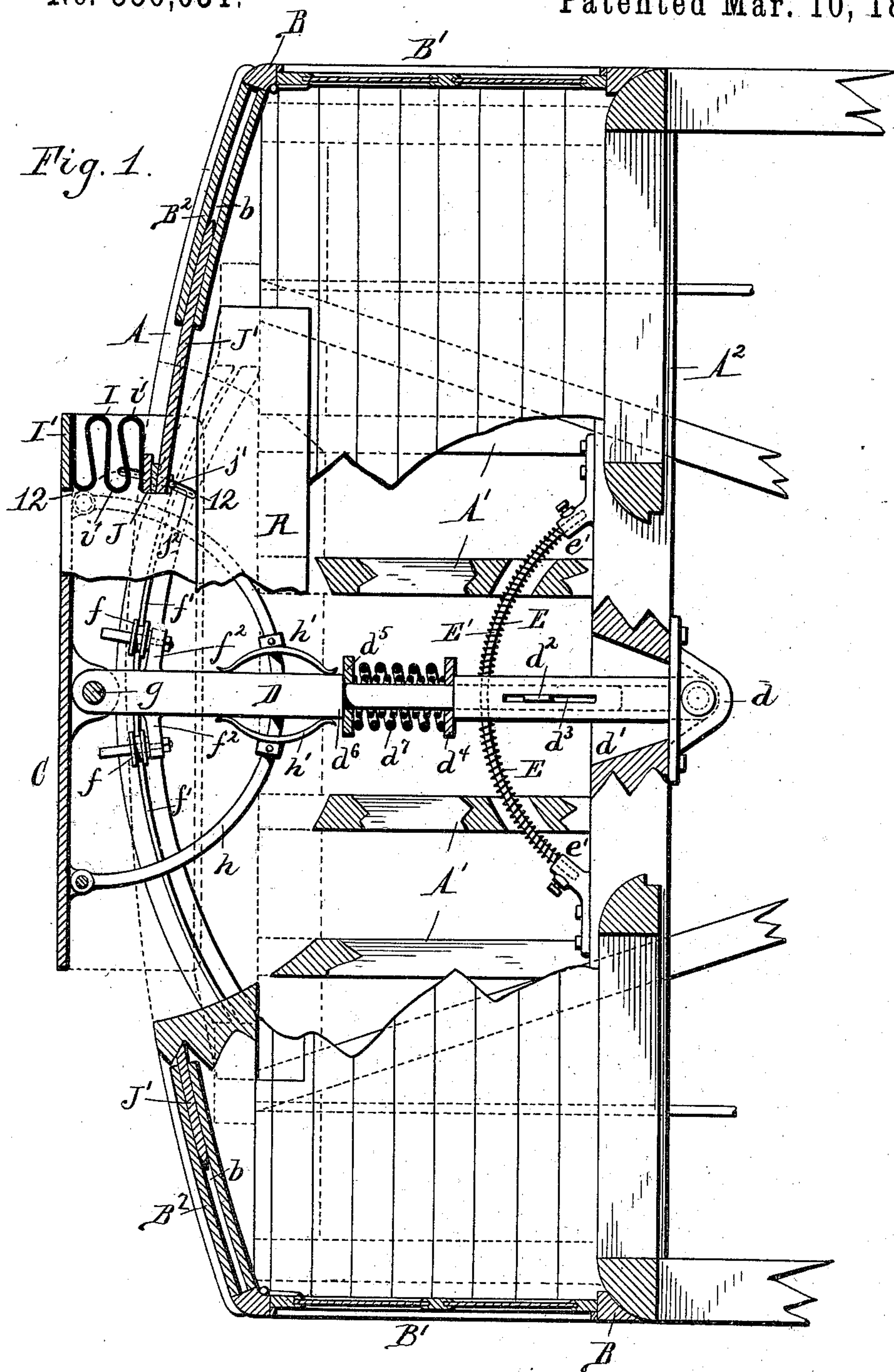
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L. B. SMYSER.
VESTIBULE RAILWAY CAR.

No. 556,031.

Patented Mar. 10, 1896.



WITNESSES:

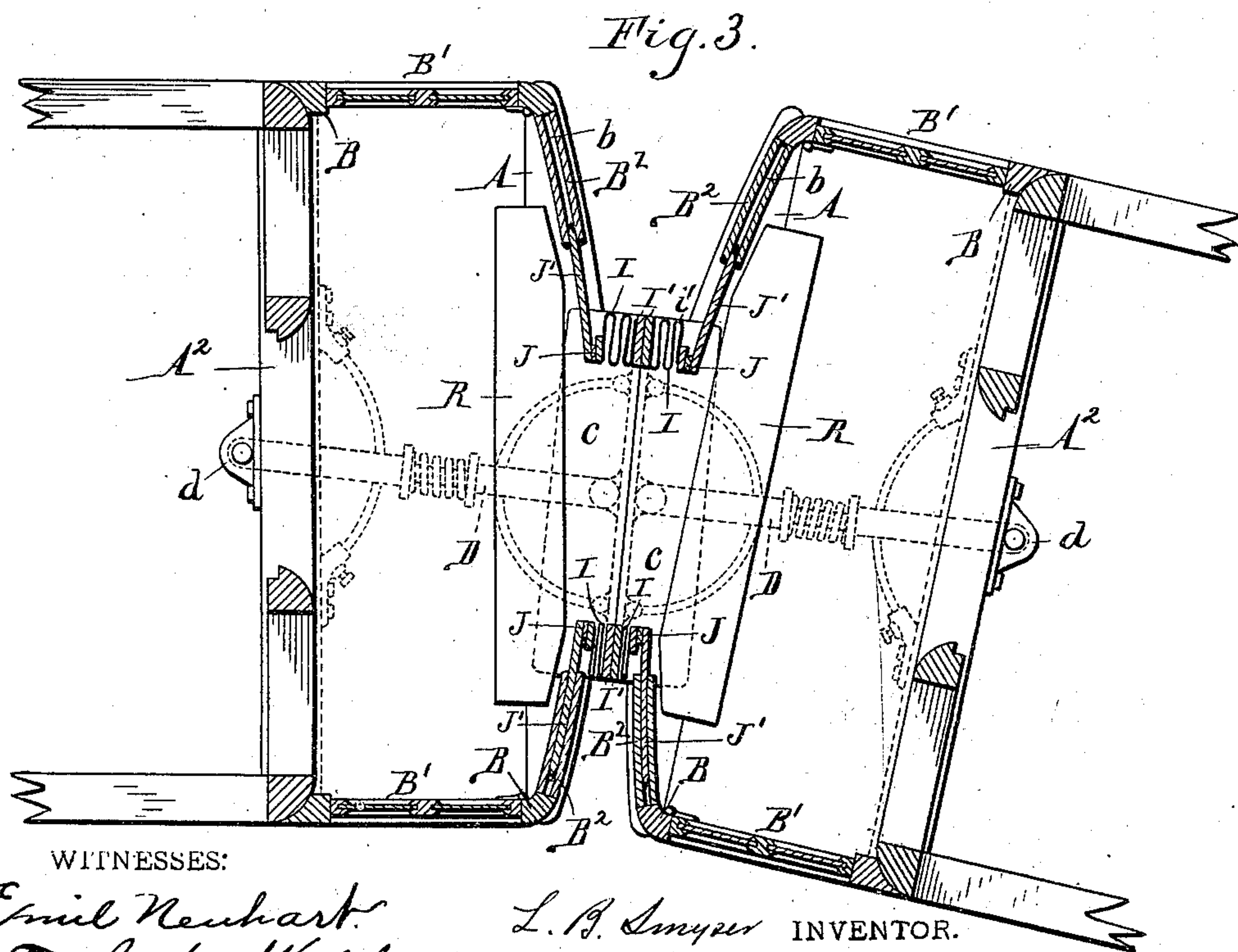
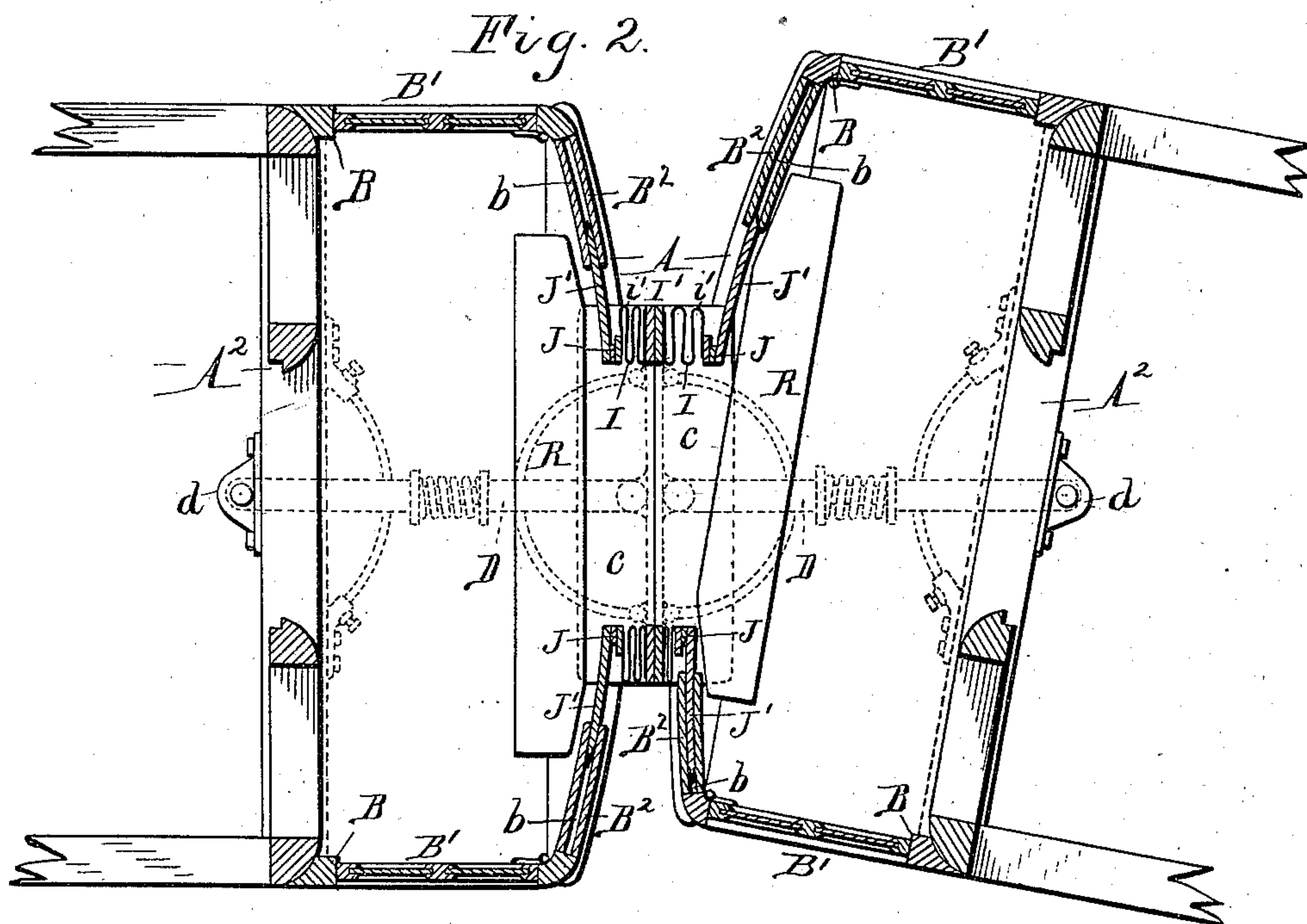
Emil Neuhart.
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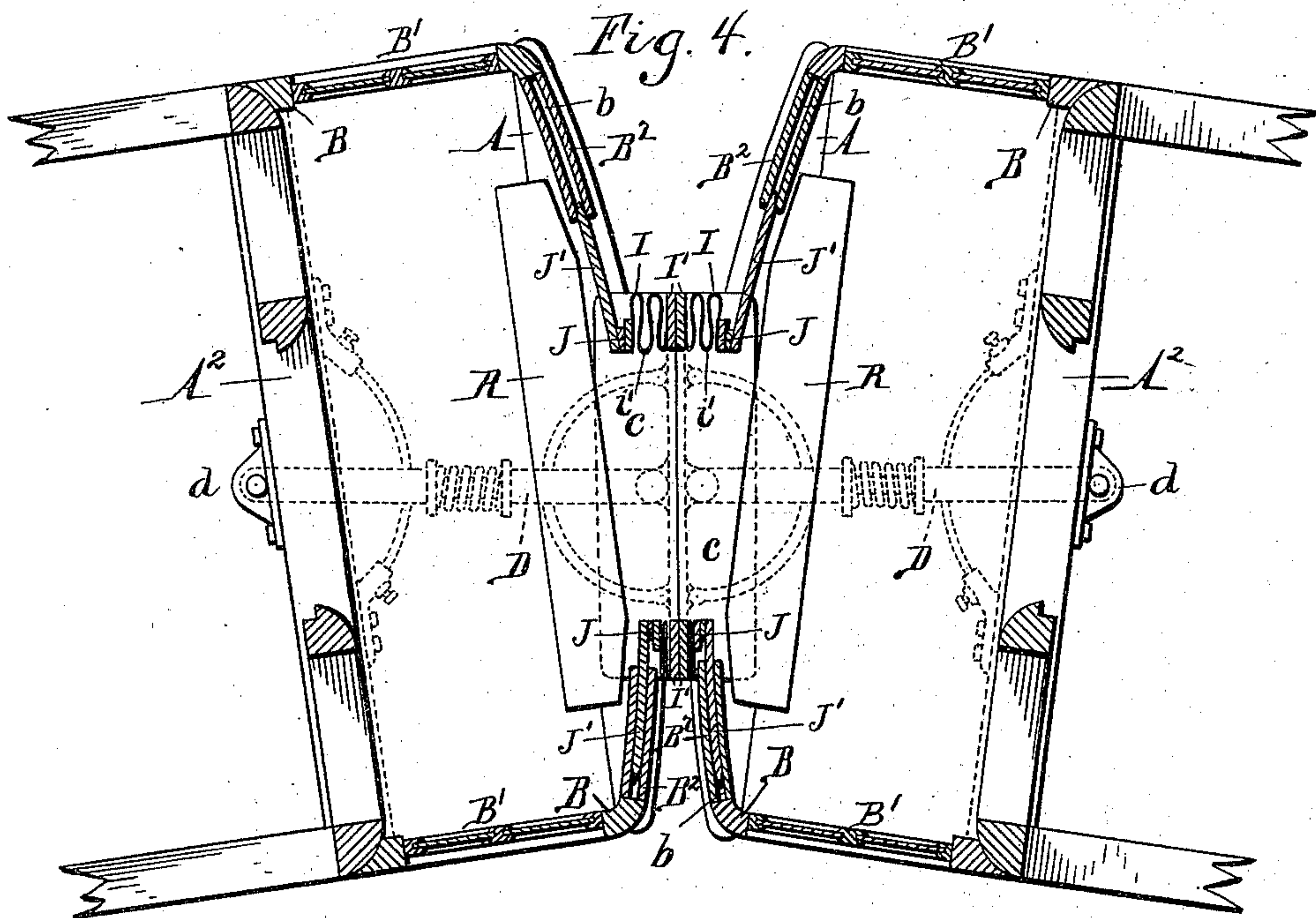
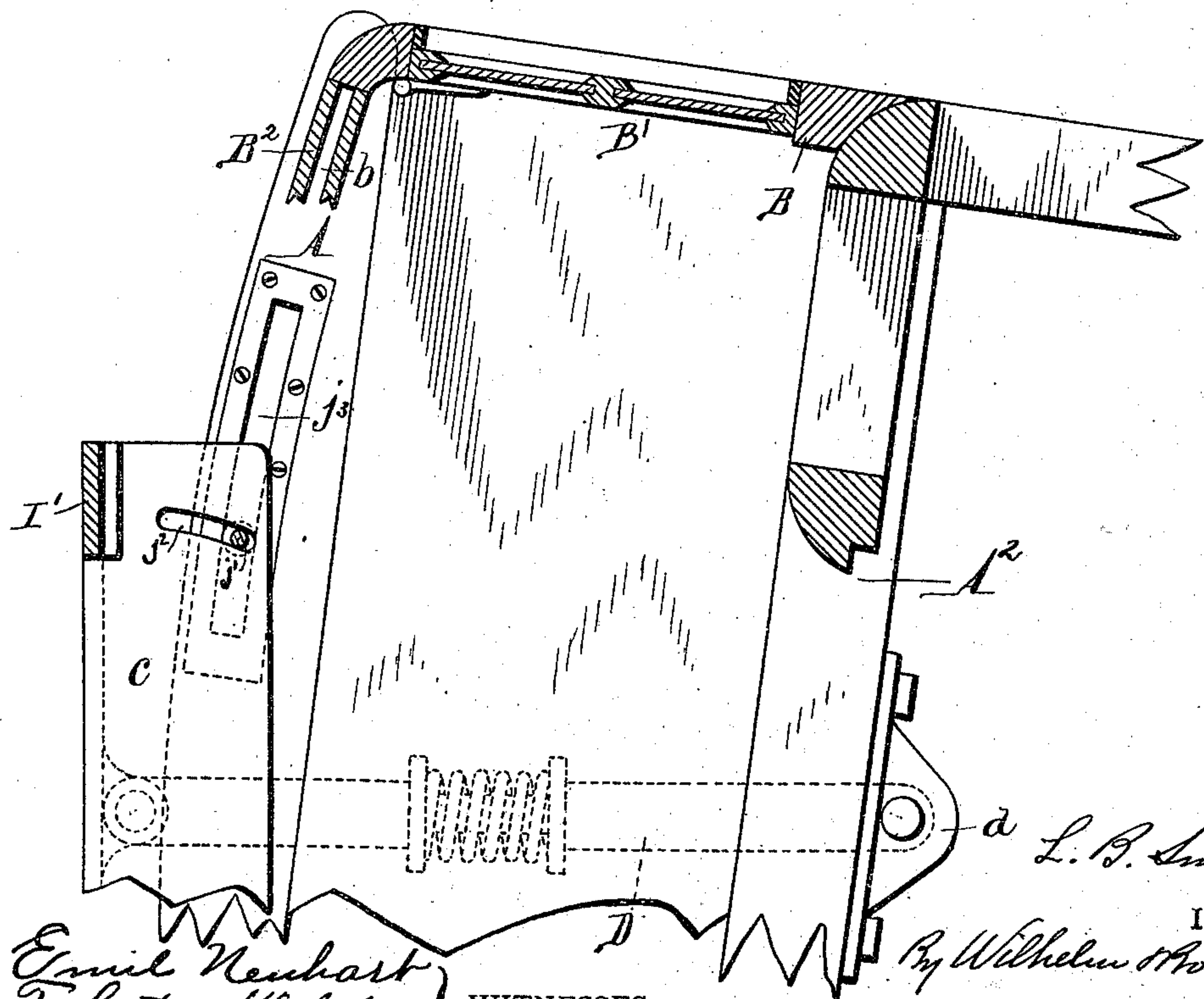


Fig. 5.



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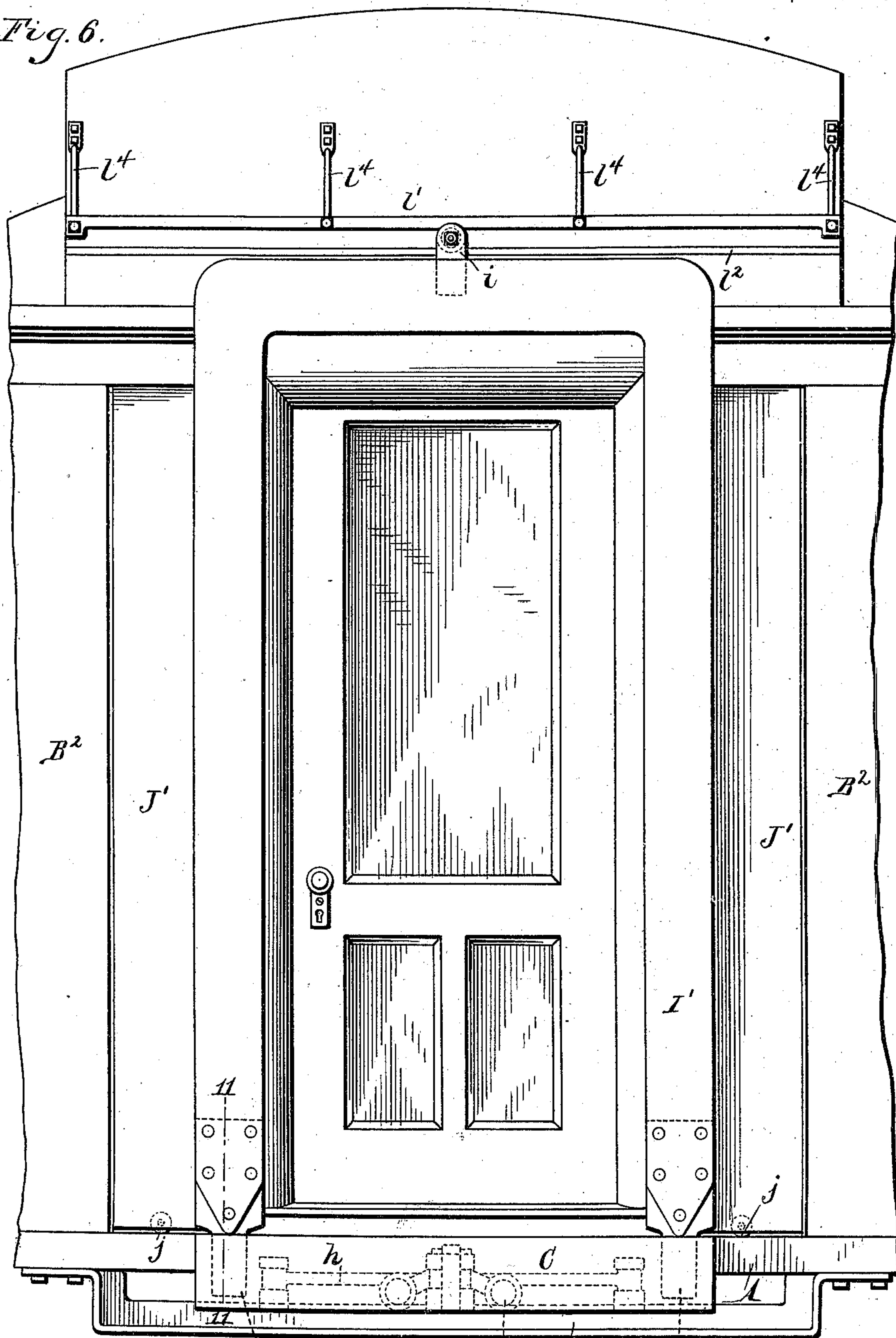
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Fig. 6.



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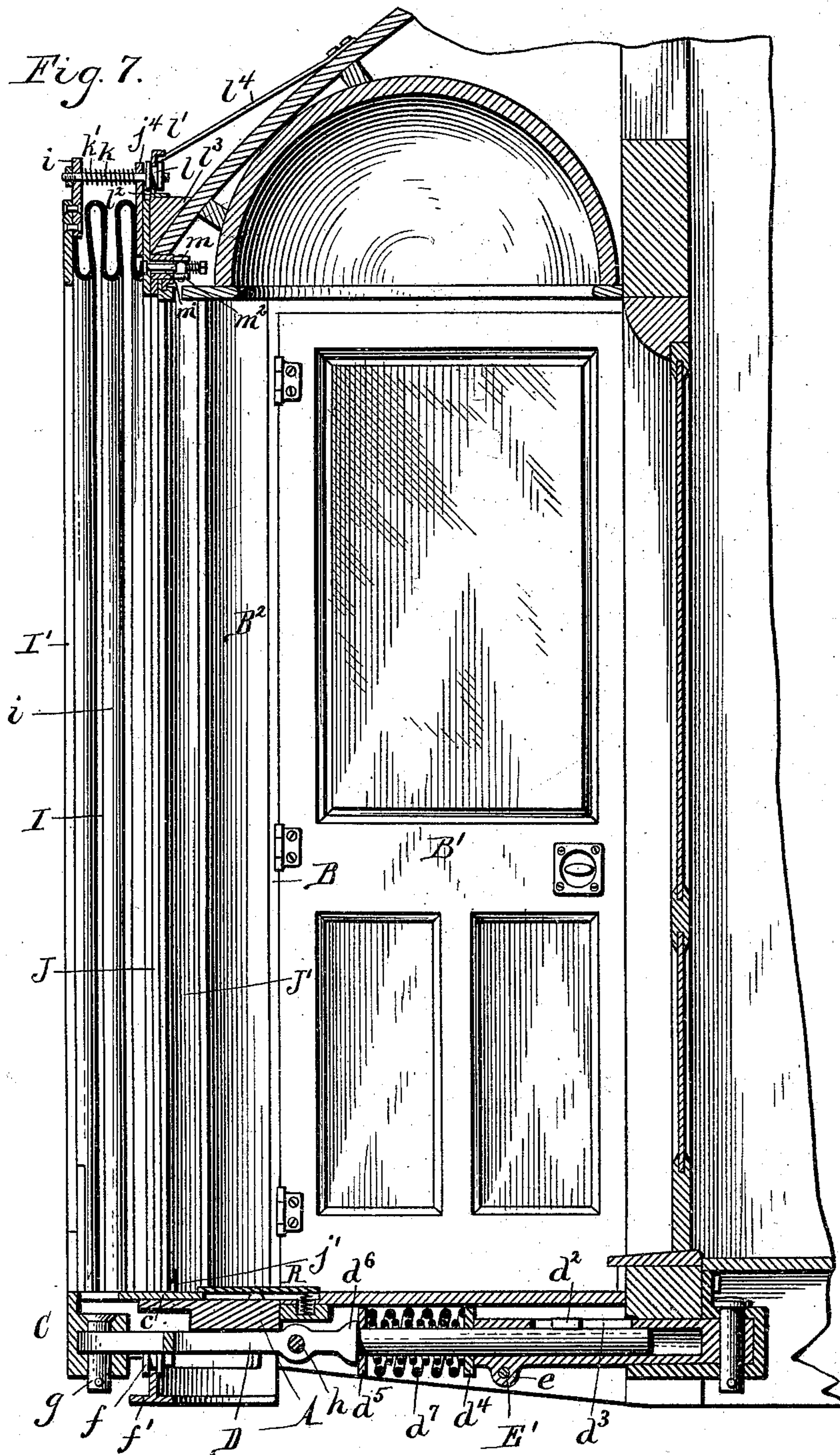
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WITNESSES:

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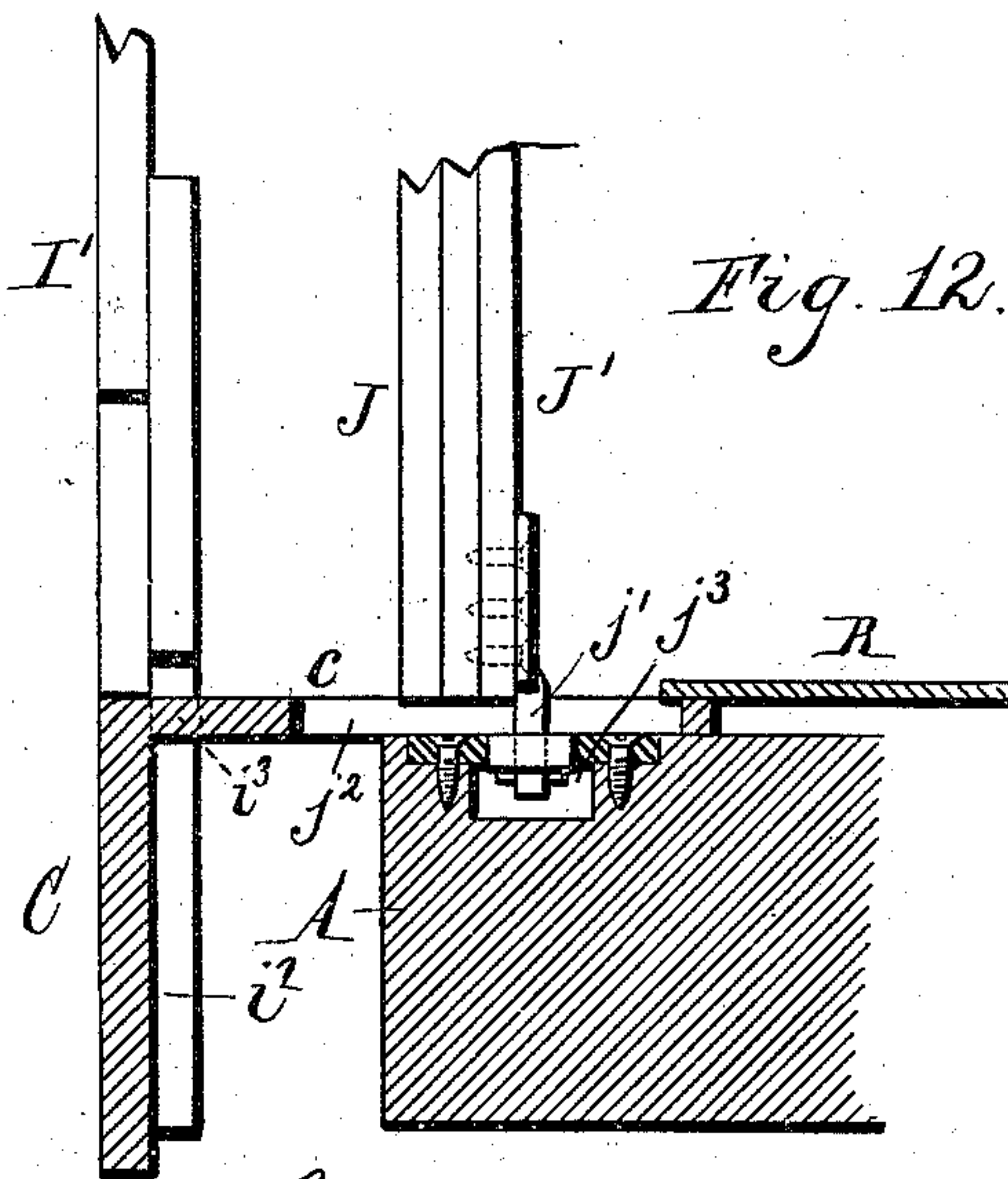
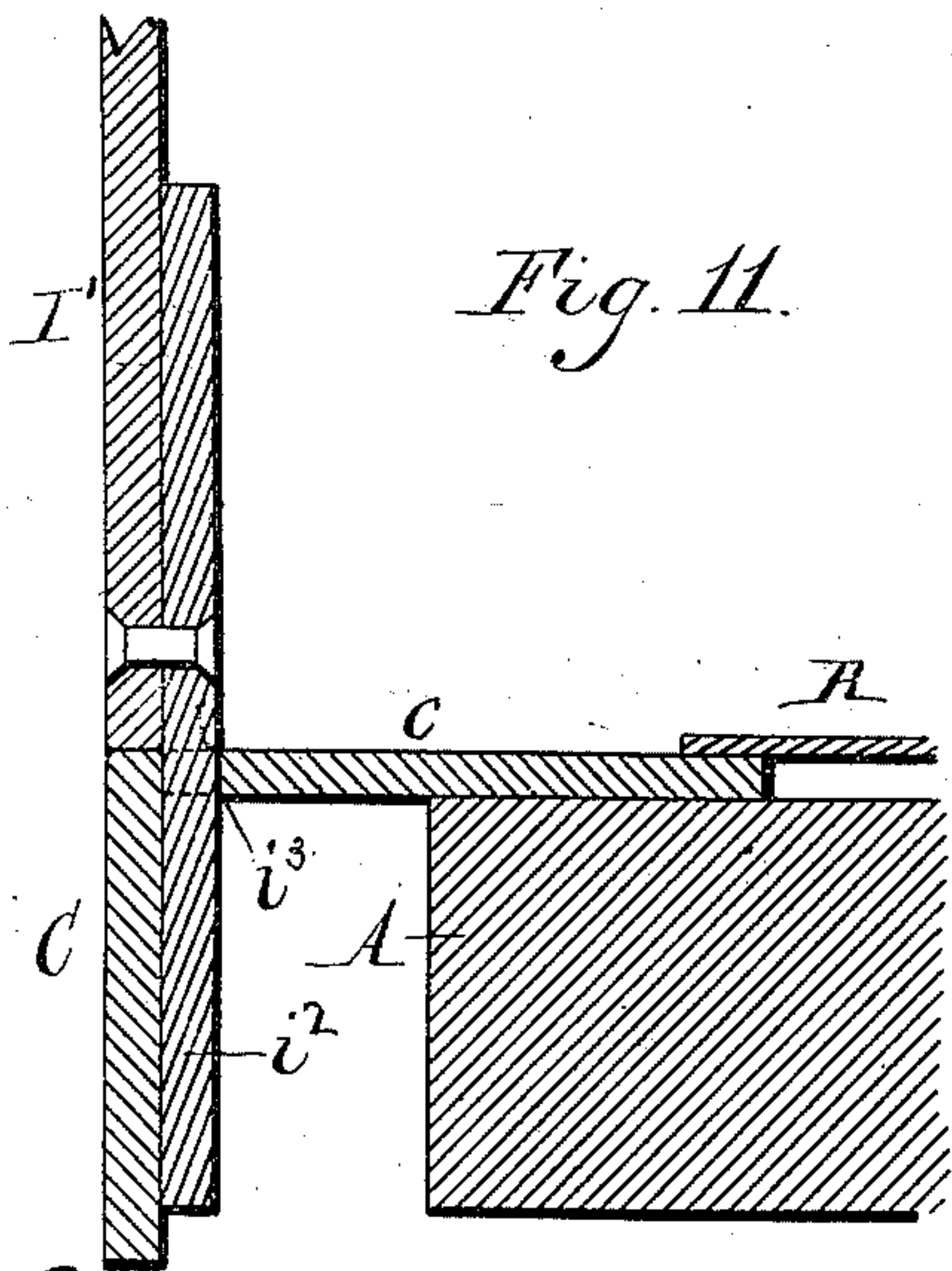
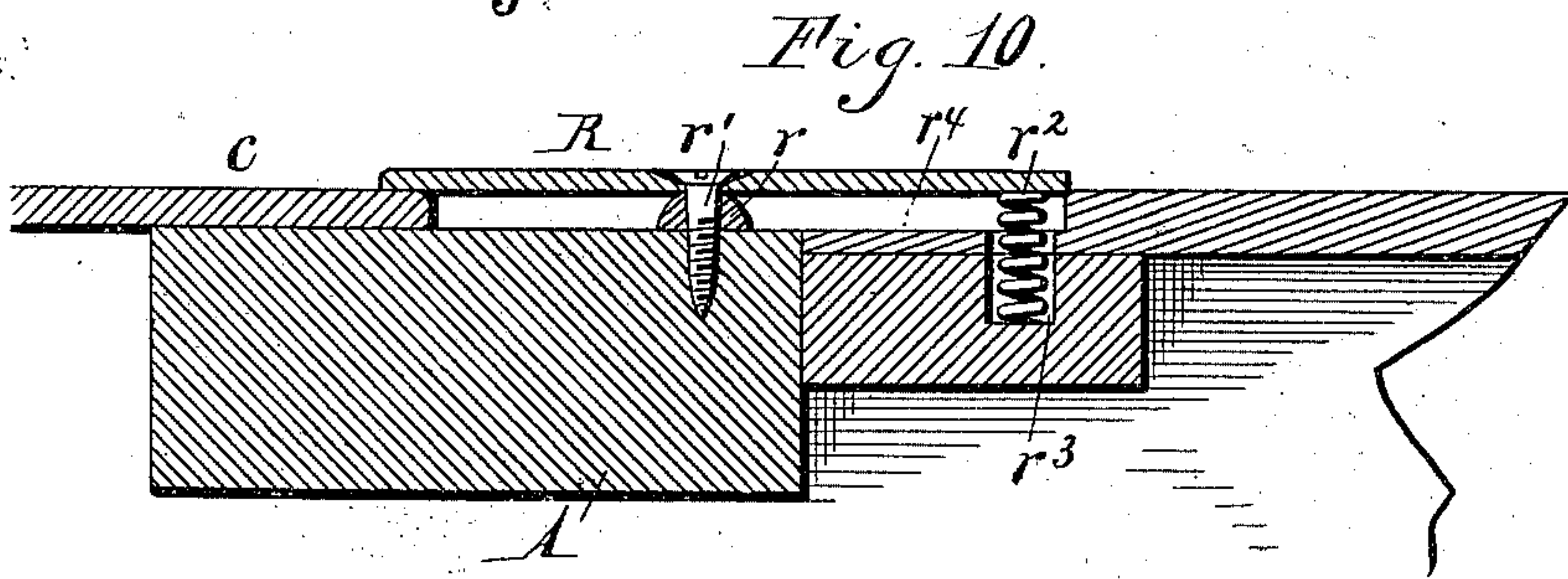
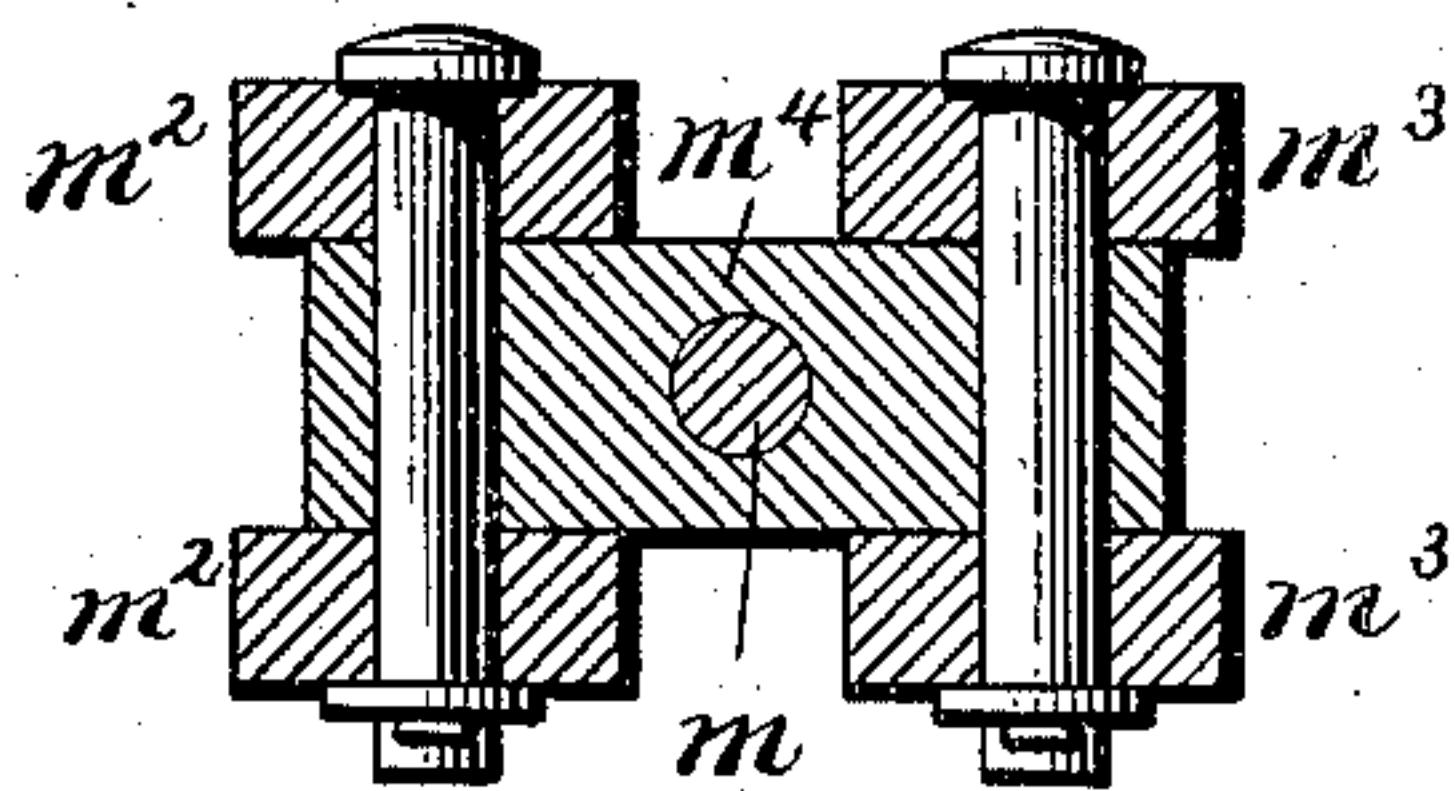
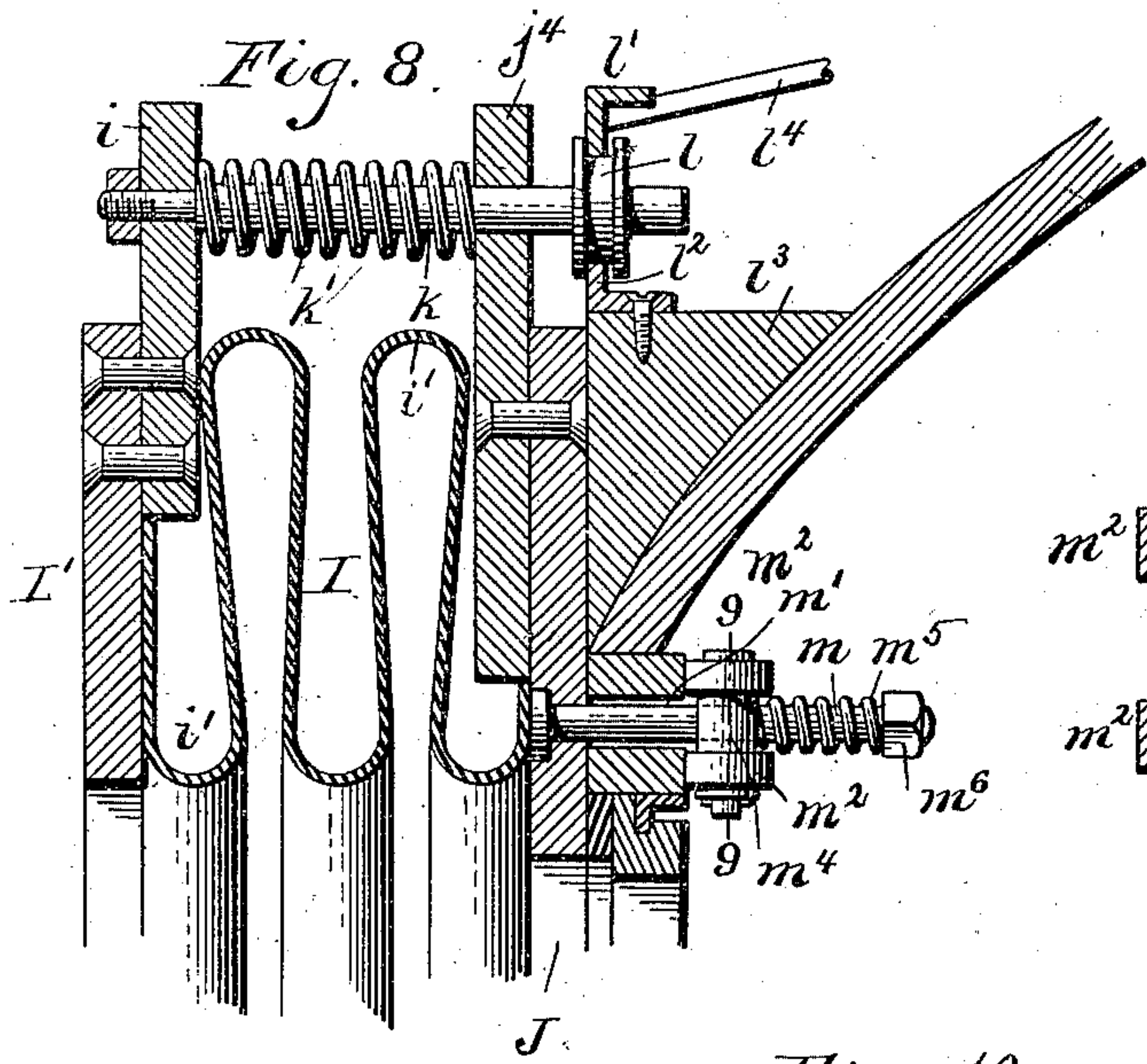
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(No Model.)

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Fig. 13.

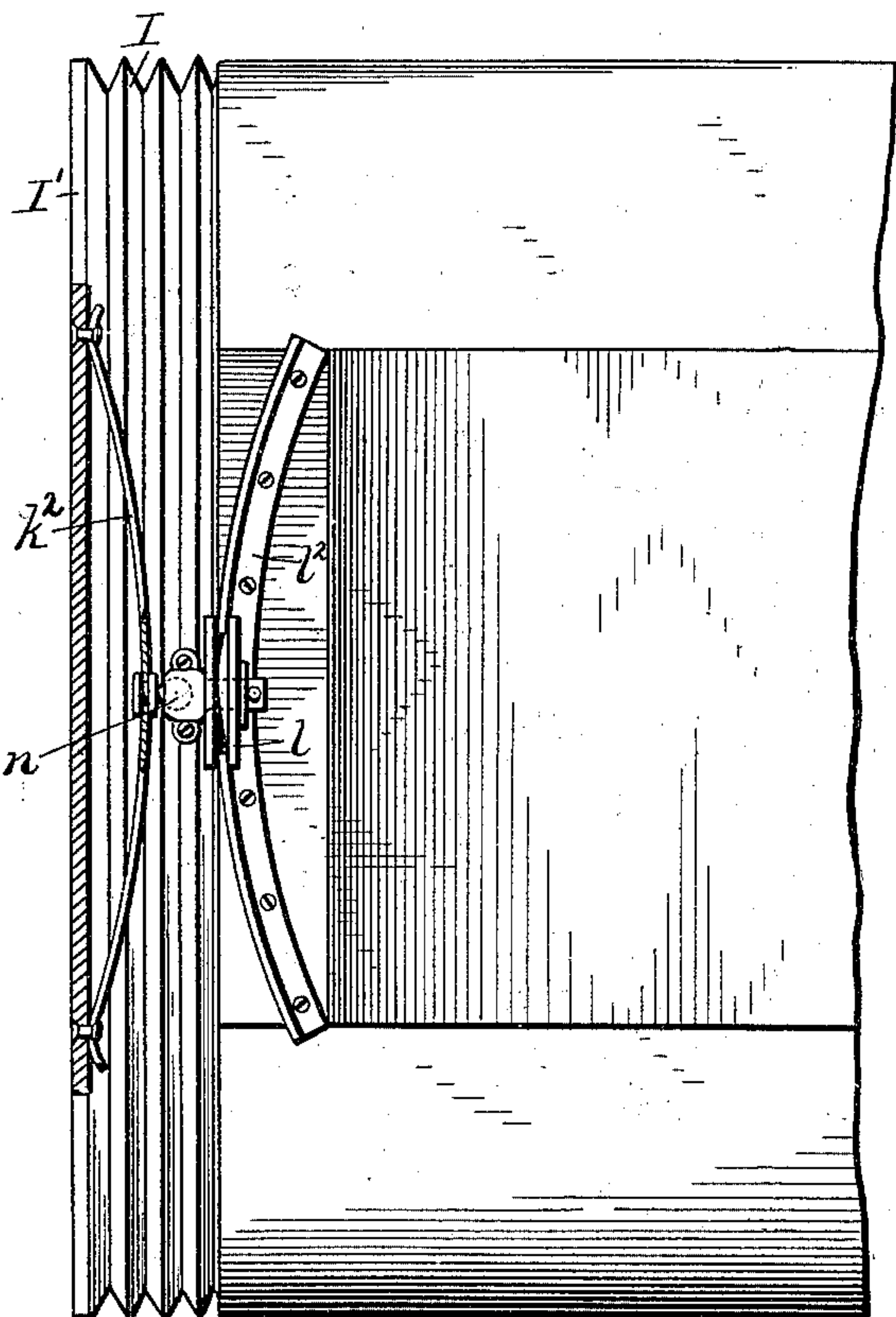
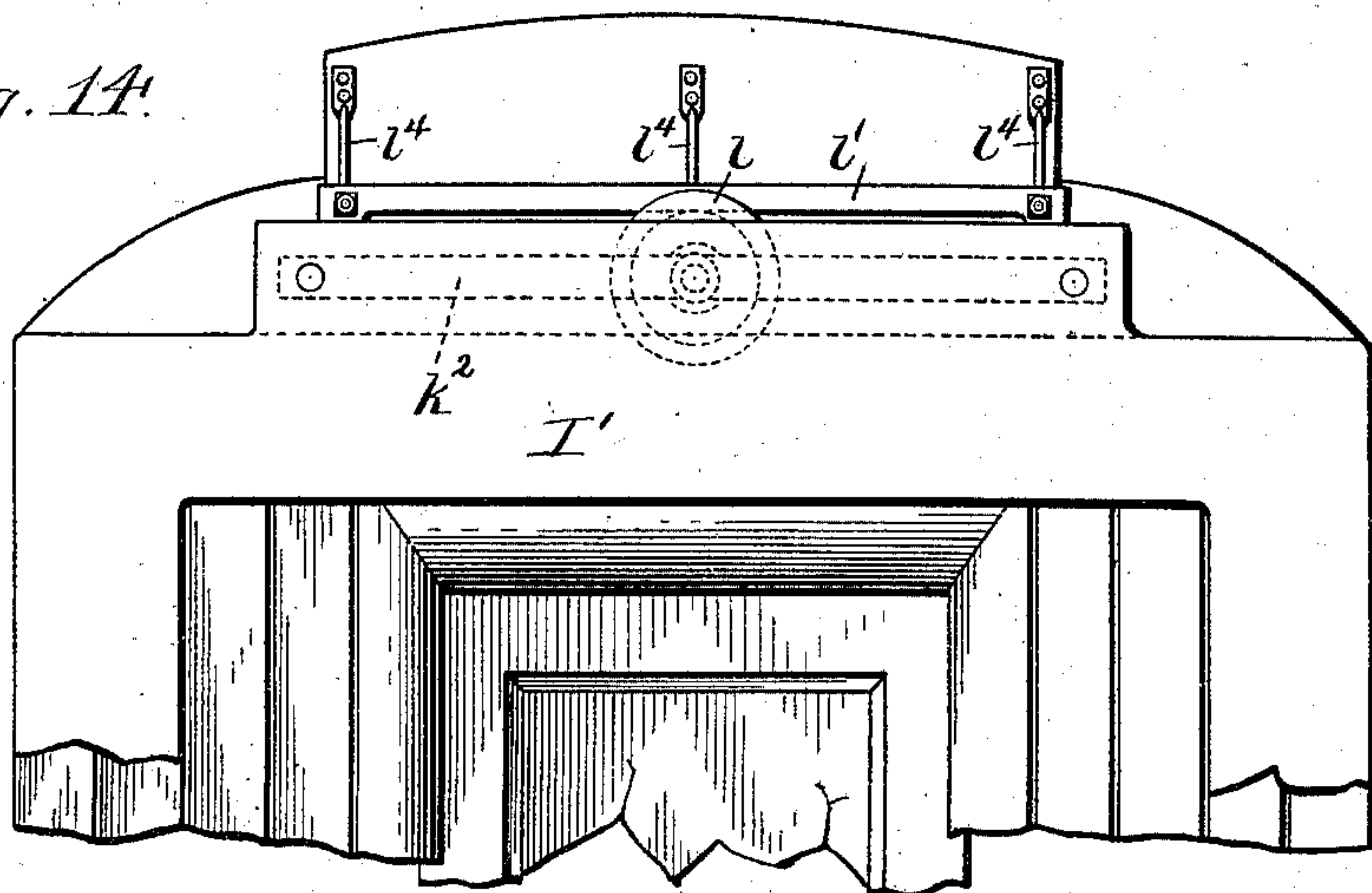


Fig. 14.



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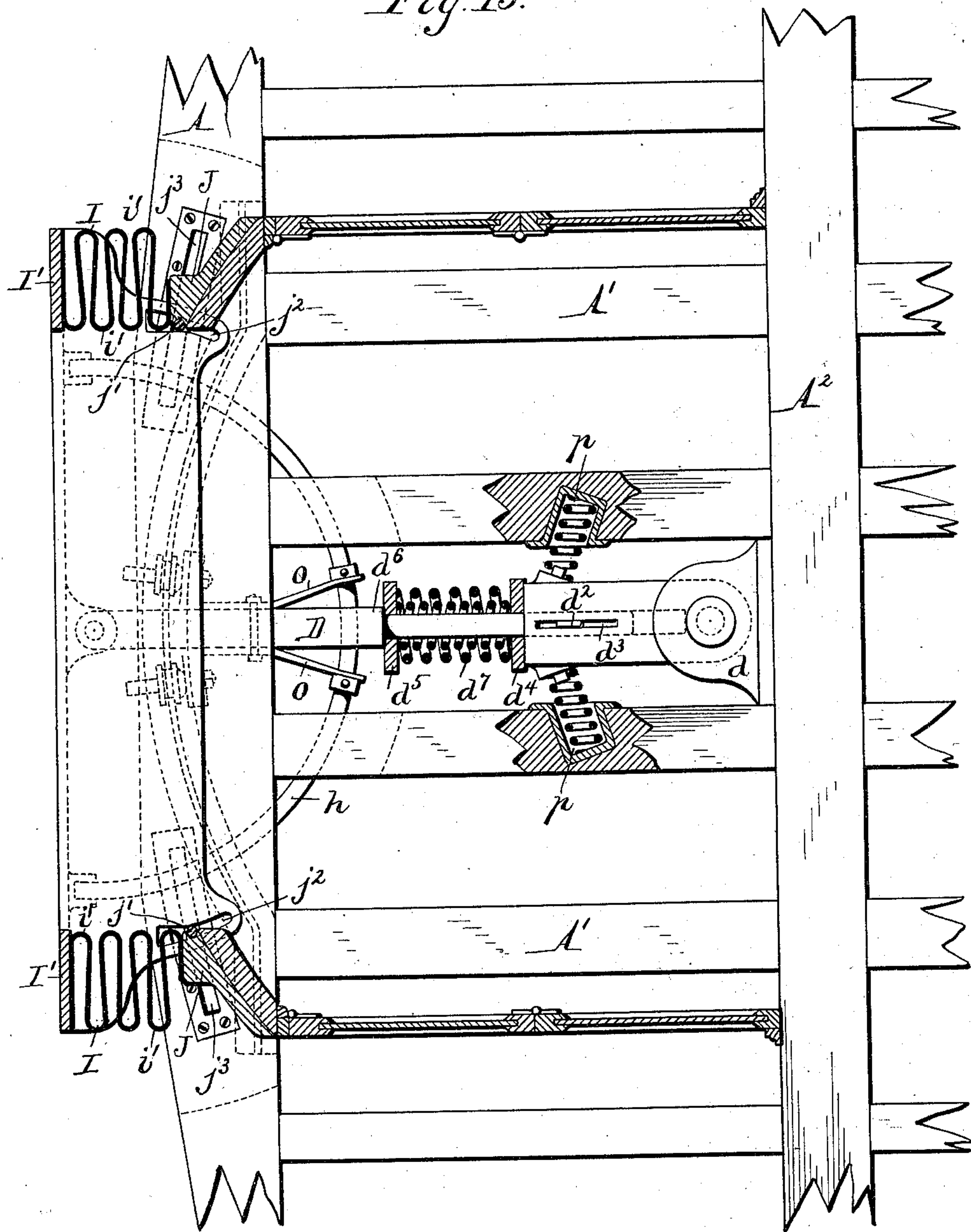
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Fig. 15.



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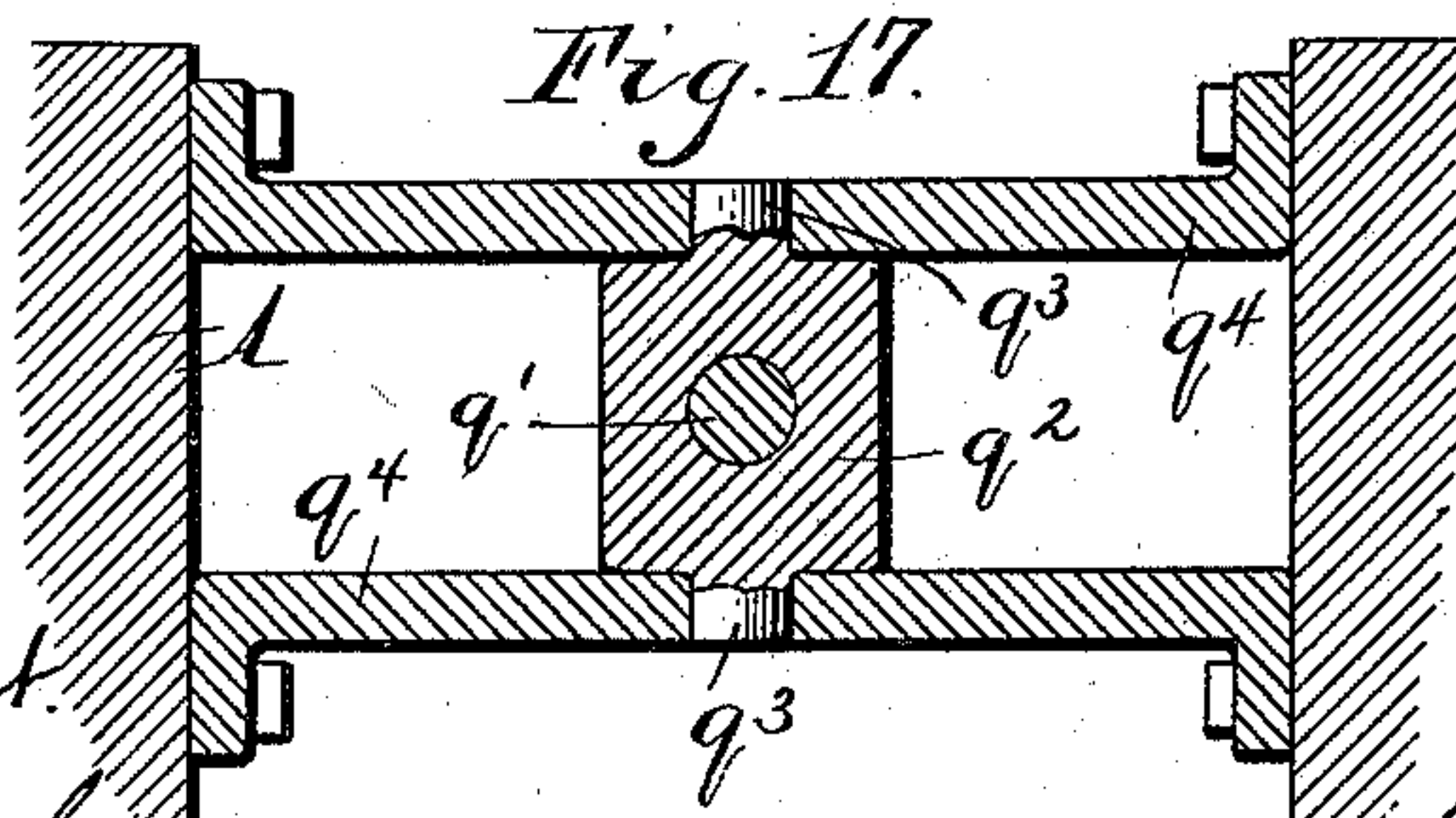
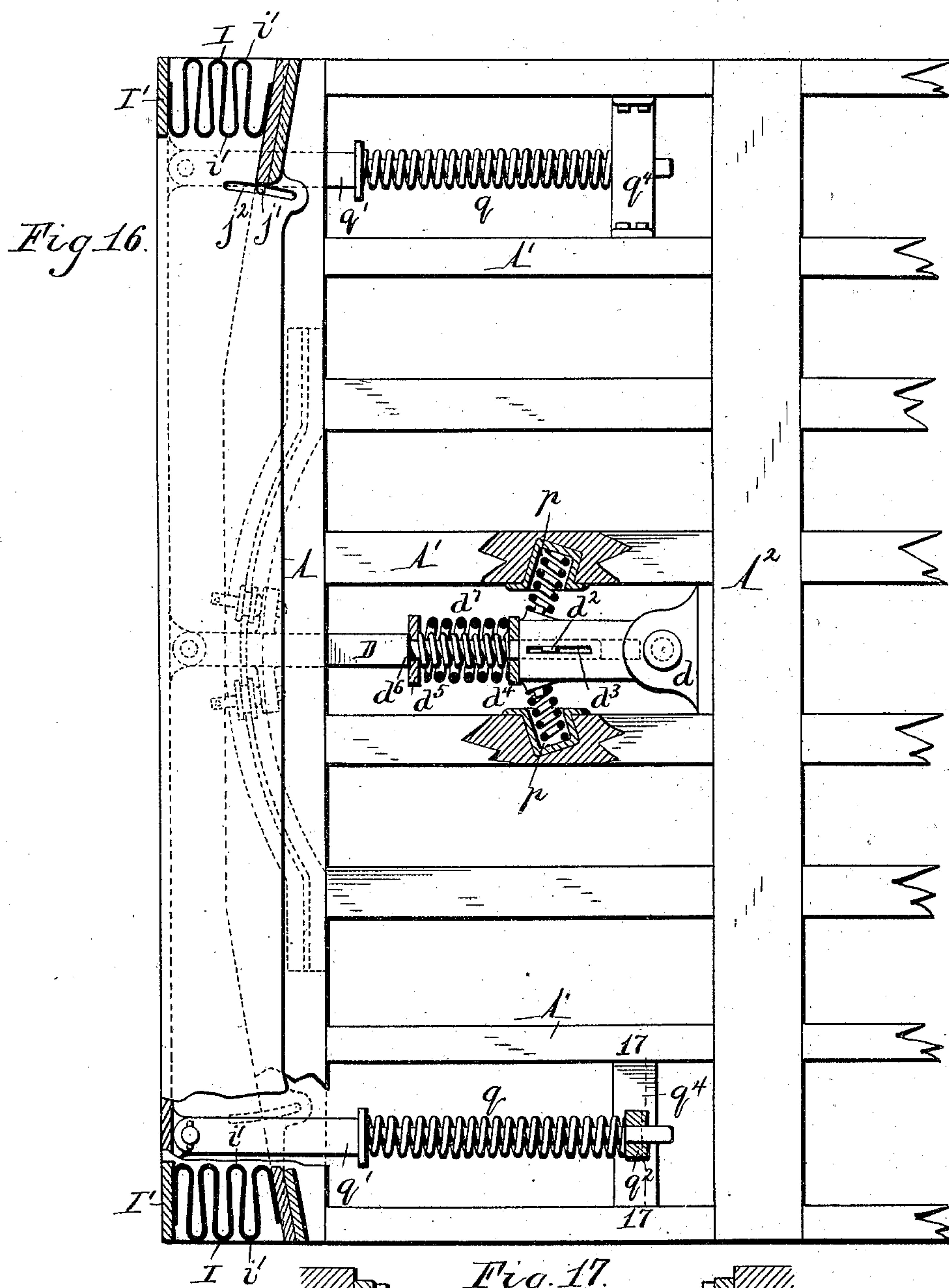
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UNITED STATES PATENT OFFICE.

LOUIS B. SMYSER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE GOULD
COUPLER COMPANY, OF NEW YORK, N. Y.

VESTIBULE RAILWAY-CAR.

SPECIFICATION forming part of Letters Patent No. 556,031, dated March 10, 1896.

Application filed February 27, 1894. Serial No. 501,653. (No model.)

To all whom it may concern:

Be it known that I, LOUIS B. SMYSER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Vestibule Railway-Cars, of which the following is a specification.

This invention relates more especially to vestibule-cars which are provided at each end with an extensible hood or housing which forms with a similar hood of an adjoining car a closed passage-way connecting the cars. These hoods have generally been supported upon an oscillating buffer-plate pivoted centrally to the end of the car, so as to permit the plate to assume a position at an angle to the end of the car in passing over curves. This construction, while allowing sufficient angular movement of the hood in rounding curves of large radius without disturbing the joint between the contacting face-plates of opposing hoods, is unsatisfactory for cars running upon roads having short or abrupt curves, such as elevated roads. When a hood of the above description is used on a car required to pass over curves of comparatively small radius, the range of motion afforded by the oscillatory buffer-plate and the flexible portion of the hood is not sufficient to maintain the face-plates of the two hoods in proper coincidence, one plate moving laterally out of line with the other plate and forming a gap at the junction of the hoods. Moreover, as the face-plates or buffer-plates are backed by springs, they tend to remain in such misplaced position under the pressure of the springs, even after the car again reaches a straight section of track. The resistance to lateral movement thus offered by the hood also tends to crowd the flanges of the car-wheels against the rails, producing excessive wear of the same.

One of the objects of my invention is to provide a construction of the buffer and vestibule hood or extension which permits a sufficient lateral movement of these parts with reference to the end of the car or vestibule to enable them to maintain a tight connection with the hood of an opposing car upon sharp

curves as well as upon long curves and straight sections of track.

Another object of my invention is to improve the construction of the folding portion of the hood, so as to prevent buckling thereof.

A further object is to provide an improved threshold-plate which forms at all times a close joint with the horizontal wing or plate extending backward from the buffer.

The invention has the further object to support the face-plate upon the buffer in such a manner as to permit it to rock freely in following the motions of the car.

In the accompanying drawings, consisting of nine sheets, Figure 1 is a horizontal section of the vestibule of an elevated-railway car provided with my improvements, the floor of the platform and a portion of the horizontal plate of the buffer being broken away to expose the parts below the same, and the buffer and extensible hood being shown in their normal central position. Figs. 2, 3 and 4 are fragmentary horizontal sections, on a reduced scale, of two such coupled cars containing my improvements, showing the different positions assumed by the hoods as the cars pass over a curve. Fig. 5 is a fragmentary horizontal section showing the parts in the position corresponding to that illustrated in the right-hand car of Fig. 4. Fig. 6 is a fragmentary end view of the car. Fig. 7 is a central longitudinal section of the vestibule. Fig. 8 is an enlarged vertical longitudinal section of the upper portion of the hood and adjacent parts. Fig. 9 is a transverse vertical section in line 9 9, Fig. 8. Fig. 10 is a fragmentary longitudinal section of the car-platform, on an enlarged scale, showing the manner of supporting the rocking threshold-plate. Fig. 11 is a vertical longitudinal section in line 11 11, Fig. 6, on an enlarged scale. Fig. 12 is a vertical section in line 12 12, Fig. 1, the hood being omitted. Fig. 13 is a top plan view, partly in section, of the vestibule, showing a modified construction of the spring at the top of the face-plate. Fig. 14 is a fragmentary end view of said modification. Fig. 15 is a fragmentary horizontal section of a surface-railway car, having a narrow vesti-

bule provided with my improvements. Fig. 16 is a similar section showing my improvements applied to a surface-car having a wide vestibule. Fig. 17 is a vertical cross-section in line 17 17, Fig. 16.

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

Referring to the construction shown in Figs. 1 to 12, inclusive, A represents the end sill of the stationary platform, and A' the longitudinal timbers thereof extending from said end sill to the end sill A² of the car-body.

B B are the side walls of the vestibule, in which are the usual doors. B' and B² are end panels of the vestibule, which extend inwardly a short distance from the side walls, so as to leave a comparatively wide passage between the same. Each of these panels is curved concentrically with the king-bolt of the car, which is not shown in the drawings, and each panel is hollow, so as to form a pocket *b* therein.

C is a transverse buffer-plate having the usual horizontal wing or plate *c* extending rearwardly over the end sill of the platform.

D is a longitudinal stem which carries the buffer-plate at its outer end and which is pivoted at its rear end to a bracket or socket *d* secured to the end sill of the car, so as to be capable of swinging laterally. The end sill of the car is formed with a flaring opening *d'*, through which the buffer-stem passes. In the construction shown in the drawings the buffer-stem consists of two telescopic sections, the rear one of which is hollow and receives the contracted rear portions of the front section. The latter is provided with a pin *d²*, which projects through a longitudinal slot *d³* in the hollow section, as shown in Figs. 1 and 7, thereby preventing the separation of the section.

d⁴ is an abutment-ring loosely surrounding the contracted portion of the front section of the buffer-stem and adapted to bear against the front end of the rear section of said stem.

d⁵ is a follower also arranged loosely on the contracted portion of said front section and adapted to abut against the shoulder *d⁶* of the front section. *d⁷* are buffer-springs which surround the front section between said abutment-ring and said follower and which resist the inward movement of the buffer, the follower moving rearwardly with the front section of the stem and compressing the springs when the buffer is pressed inward.

EE represent centering-springs which yieldingly hold the buffer-stem and the buffer in their normal position and which return these parts in that position when the car passes from a curve upon a straight section of track.

These springs surround a stationary bow-shaped guide-rod E' and bear with their front ends against opposite sides of the buffer-stem. This guide-rod passes through a perforated lug *e*, formed on the stem, as shown in Fig. 7, and is arranged at its ends in sockets *e'* secured to the front side of the end sill of the car.

The front portion of the buffer-stem is supported by grooved rollers *f*, which run upon a curved horizontal track *f'* supported underneath the end sill of the car-platform. This track is curved concentrically with the rear pivot of the buffer-stem. The journals of the rollers *f* are secured to opposite ends of a yoke *f²* upon which the buffer-stem rests, and the rollers are mounted loosely on the journals, so that the latter are free to slide lengthwise in the rollers as the buffer-plate moves inward and outward.

The buffer-plate is preferably pivoted centrally to the outer end of its stem by a vertical pin *g*, to permit the same to oscillate upon the end of the stem in accommodating itself to the angular positions assumed by the end of the car in rounding curves.

h is a horizontal bow-shaped guide or yoke secured at its ends to the rear side of the buffer-plate and sliding with its central portion in a horizontal opening formed in the buffer-stem a short distance in rear of its front end.

h' are semielliptical righting-springs secured to the guide *h* and bearing against opposite sides of the buffer-stem. These springs, while permitting the buffer-plate to oscillate on its pivot, tend to maintain the same in its normal position parallel with the end of the platform.

I represents the flexible side and top portions of the extensible hood or vestibule extension, and I' is the usual metallic face-plate attached to the outer end of the hood. The rear end of the flexible hood is secured to the face of an open frame or door plate J, which is substantially similar in construction to the face-plate I' and capable of moving laterally on the end of the vestibule.

J' represents upright wings or panels secured at their outer edges to the stiles of the door-plate J and sliding in the pockets *b* of the hollow panels B² of the vestibule. These wings or slides are provided at their lower ends with antifriction-rollers *j*, which run upon the end sill of the platform and support the door-frame as well as the wings. This door-frame with its wings is compelled to move laterally with the buffer by vertical pins or projections *j'*, secured to the outer lower ends of the wings and passing through transverse slots or guides *j²* formed in the horizontal plate of the buffer and curved concentrically with the pivot on which the buffer oscillates, as clearly shown in Fig. 1. The pins *j'* are preferably provided with antifriction-rollers, which run against the sides of the slots. These slots and pins, while compelling the door-plate and connecting parts to take part in the lateral movements of the buffer, permit the latter to swing on its pivot without effecting the position of the hood.

In order to permit the end of the car in rounding curves to swing at an angle to an opposing car without carrying the buffer and hood with it, the end sill of the platform is provided with a transverse slot *j³*, through

which the pins j' of the wings pass, and which is curved concentric with the king-bolt of the car before referred to.

The upper portion of the face-plate I' is connected with the adjacent portion of the laterally-movable door-plate J by a longitudinal rod k , which is secured to an upward extension i of the face-plate and slides with its rear portion in an opening formed in a similar extension j^4 of the door-plate, as clearly shown in Fig. 8.

k' represents a spring which surrounds the rod k between the upward extensions of the face-plate and the door-plate and whereby the face-plate is pressed outward against the face-plate of an opposing vestibule-hood.

l represents a guide-roller mounted upon the connecting-rod k in rear of the door-plate J and running between curved guide rails or tracks l' l^2 , secured to the adjacent end of the car-roof, the lower rail, l^2 , being secured to the upper side of a cross-piece l^3 and the upper rail being supported by arms l^4 . This guide-roller l is mounted loosely on the connecting-rod k to permit the latter to slide through the roller as the face-plate moves inward or outward, the projecting rear portion of the rod being made sufficiently long for this purpose.

m represents a retaining-bolt whereby the upper portion of the door-plate is yieldingly held in close contact with the contiguous portion of the vestibule. This bolt is attached at its front to the door-plate and passes rearwardly through a horizontal slot m' formed in the end wall of the vestibule above the door-opening, as shown in Fig. 8.

m^2 m^3 represent two sets of antifriction-rollers which bear against the inner side of the end wall of the vestibule on the upper and lower sides of the slot m' and which are journaled in the ends of a yoke m^4 mounted on the retaining-bolt m . These rollers are pressed against the inner side of the vestibule-wall by a spring m^5 surrounding the retaining-bolt between the rear side of the yoke m^4 and an adjusting-nut m^6 , arranged on the screw-threaded rear end of the bolt. This draws the door-plate closely against the end wall of the vestibule and maintains a tight joint between these parts in all portions of the hood.

It will be understood from the foregoing description that the buffer and the hood, composed essentially of the outer or face plate, I' , the inner or door plate, J , and the intermediate flexible connection, are both capable of shifting bodily toward either side of the car, the entire hood-and-buffer structure swinging concentrically with the rear pivot of the buffer-stem and the buffer, in addition to its lateral movement, being capable of an independent oscillatory motion.

When the hood moves to one side of the longitudinal center line of the car in rounding a curve, the slide or panel J' on that side of the hood which faces the inner side of the

curve is pushed farther into its pocket, while the opposite side is to the same extent withdrawn from its pocket, thus closing the spaces between the hood and the stationary panels of the end wall of the vestibule in all positions of the hood.

Fig. 2 of the drawings shows the relative position of the hoods of two opposing cars when one car is upon a curve and the other is about to pass upon the curve, the hood and buffer-stem of the latter car being in their normal central position and the hood of the former being shifted to one side of its central position.

Fig. 3 shows the relative positions of the hoods and buffer-stems after the hoods of both cars have shifted laterally and just before the second car passes upon the curve.

Fig. 4 shows the relative position of the hoods and buffer-stems when both cars are upon the curve.

By making the hoods bodily movable side-wise of the car they are enabled to remain in line with each other in any of the various positions assumed by the cars in passing around curves, irrespective of the abruptness of the curve, thereby rendering the improvement especially advantageous for cars running upon elevated railroads, which generally have many sharp curves. A close joint is thus not only maintained between the hoods, but the excessive wear of the face-plates of the hoods and of the car-wheel flanges, produced by the resistance to lateral movement offered by the hoods heretofore employed, is obviated, and the retarding of the speed of the train caused by such resistance is also avoided.

If desired, a transverse semielliptical spring N may be substituted for the spiral spring k^2 , as shown in Figs. 13 and 14. In this case the ends of the spring are secured to the rear sides of the face-plate and the spring is connected at its middle to the journal of the guide-roller l , preferably by a ball-and-socket joint n . The journal is in this case held against axial movement in the roller.

In Fig. 15 my improvement is shown in a modified form in connection with a surface-railway car having a narrow vestibule. In this case the hood and buffer move laterally, as in the previously-described construction, but the inner or door plate, J , of the hood, instead of being flat is curved concentrically with the rear pivot of the buffer-stem, and the contiguous portions of the end wall of the vestibule are correspondingly curved, while the wings or extensions of the door-plate are arranged against the outer sides of the end wall of the vestibule instead of in pockets in the wall. This modification shows flat springs o in place of the semielliptical springs h' of the first construction, said springs being secured at their front ends to the opposite sides of the buffer-stem and bearing with their free rear ends against the inner sides of the collars on the bow-shaped guide. The bow-shaped guide-rod E' is omitted and short

spiral springs seated in sockets p in the middle timbers of the platform are substituted for the long spiral springs mounted on said guide-rod.

5 Figs. 16 and 17 show the application of my improvements to a surface-railway car having a wide vestibule extending the full width of the car. The construction of the hood and the end of the vestibule is the same as that
10 shown in Fig. 15, except that the contiguous faces of these parts are curved concentrically with the king-bolt of the car, instead of the rear pivot of the buffer-stem. Owing to the width of the buffer in this case the same is
15 provided with side buffer-springs q and stems q' in addition to the central springs. In order to give the rear ends of these side stems the necessary oscillating motion, their rear portions pass loosely through swiveling-blocks
20 q^2 , which are provided with vertical trunnions q^3 arranged in bearings formed in horizontal bars q^4 , which are secured between the longitudinal side timbers of the platform, as shown in Fig. 17.

25 R represents the threshold-plate which overlaps the horizontal wing of the buffer. This plate is supported between its front and rear edges upon a transverse bar r having a curved or convex upper surface, which permits the
30 threshold-plate to rock freely thereon. The plate is loosely held upon this bar by screws r' passing through elongated openings or slots formed transversely in the plate.

r^2 represents springs which bear against the
35 under side of the plate, in rear of the convex supporting bar, and which are seated in sockets or depressions r^3 formed in a stationary block. These springs tend to swing the rear portion of the threshold-plate upwardly, there-
40 by depressing its front portion, keeping it in yielding contact with the wing of the buffer, and forming a close joint with said wing. The flooring of the platform is recessed to receive the rear portion of the threshold-plate,
45 as shown at r^4 , Fig. 10.

Heretofore the flexible portion of the hood has generally been plaited in the form of zig-zag or accordion folds having sharp angles.

When opposing cars having such accordion
50 hoods are separated to their fullest limit the folds of the hood are straightened out to such an extent that they often fail to collapse properly when the hood is again contracted, causing the same to buckle or bulge. The
55 space available for the hood is limited, and the construction above described does not permit the flexible material of the hood to be made sufficiently full to avoid straightening out of the folds under a full separation of the
60 cars. To overcome this objection, the adjacent folds or plaits of my improved hood are connected by blunt or rounded portions i' instead of sharp or angular portions, as hitherto constructed. This construction permits the
65 use of more material within a given limit than the sharp angular construction, and the folds are fully straightened out when the cars sepa-

rate to their greatest limit, thus preventing buckling of the hood in contracting.

The stiles of the face-plate are provided at
70 their lower ends with downward extensions or contracted tenons i^2 , which pass loosely through the longitudinal slots i^3 formed in the horizontal plate of the buffer, as shown in Figs. 6, 11, and 12. These tenons prefer-
75 ably consist of separate plates, which are secured to the rear sides of the face-plate, as shown. The lower ends of the stiles of the face-plate are preferably tapered and round-
80 ed and rest loosely upon the longitudinal plate of the buffer. By this construction the lower portion of the face-plate is confined against lateral displacement with the buffer-plate, but allowed to rock freely on its tapered lower
85 ends and follow the swaying motions of the car.

I claim as my invention—

1. The combination with the platform of a railway-car, of a laterally-movable stem an oscillating buffer-plate pivoted to the outer
90 end of said stem, a bow or yoke sliding in said stem and secured at its ends to the buffer-plate and springs arranged on said yoke and bearing against opposite sides of said stem, substantially as set forth. 95

2. The combination with the car-platform, of a buffer, a laterally-movable stem carrying said buffer, a track arranged underneath the buffer and a guide-roller running upon said track and supporting the outer portion of the
100 buffer-stem, substantially as set forth.

3. The combination with the car-platform, of a buffer, a laterally-movable stem carrying said buffer, a track arranged underneath the buffer and a guide-roller running upon said
105 track, supporting the outer portion of the buffer-stem, and having a journal capable of sliding axially in the roller, substantially as set forth.

4. The combination with the car-body, of
110 a laterally-movable supporting or door plate arranged adjacent to the end of the car-body, a laterally-movable face-plate arranged in front of said door-plate and an intermediate hood connecting said door and face plates, substantially as set forth. 115

5. The combination with the car-body, the buffer-plate and the laterally-movable supporting or door plate arranged adjacent to the end of the car-body, a face-plate supported
120 upon the buffer-plate and an extensible hood connecting said door and face plates, substantially as set forth.

6. The combination with the car-body, of a laterally-movable supporting or door plate
125 arranged adjacent to the end wall of the car-body, a laterally-movable face-plate arranged in front of said door-plate, and extensible hood connecting said door-plate with the face-plate, and a retaining device which holds said
130 door-plate against the end wall of the car-body but permits the same to move laterally therein, substantially as set forth.

7. The combination with the car-platform

having a transverse slot or guide, of a laterally-movable door-plate arranged adjacent to the end wall of the car and having a pin or projection entering said slot or guide, and an extensible hood attached at its rear portion to said door-plate, substantially as set forth.

8. The combination with the end wall of the car body or vestibule having a door-passage, of a laterally-movable hood having its rear portion arranged adjacent to said end wall and provided on opposite sides with wings or extensions for closing the spaces between the hood and the end wall when the hood is shifted, substantially as set forth.

9. The combination with the car-vestibule having a passage in its rear wall and hollow panels or pockets on opposite sides of said passage, of a hood having its rear portion arranged adjacent to said rear wall and provided on opposite sides with wings or extensions which slide in said pockets or panels, substantially as set forth.

10. The combination with the car-platform having a transverse slot, of a laterally-movable oscillating buffer having a horizontal wing provided with curved slots, a laterally-movable door-plate arranged adjacent to the end wall of the car or vestibule and having pins or projections passing through the slots of the platform and the buffer-wing, substantially as set forth.

11. The combination with the end wall of the car or vestibule, and the laterally-movable face-plate of the extensible hood, of a guide or track arranged on the upper portion of the car and a guide-roller running on said track and connected with said face-plate, substantially as set forth.

12. The combination with the end wall of the car or vestibule and the laterally-movable face-plate of the extensible hood, of a guide or track arranged on the end of the car above the hood, a guide-roller running on said track, and a journal capable of sliding axially in said roller and connected with the face-plate, substantially as set forth.

13. The combination with the end wall of the car or vestibule, the laterally-movable inner or door plate of the hood, and the laterally-movable outer or face plate thereof, of a track arranged on the end of the car above the hood, a guide-roller arranged on said track, a journal sliding axially through said roller and attached to the face-plate, and a spring surrounding said journal between the upper portions of the face and door plates of the hood, substantially as set forth.

14. The combination with the end wall of the car or vestibule, having a horizontal slot, and the laterally-movable inner or door plate of the hood, of a retaining-bolt attached to said door-plate and extending through said slot, a truck having rollers running against the inner side of said slotted wall and a spring arranged on said bolt and bearing against said track, substantially as set forth.

15. The combination with the car-platform and the buffer, of a movable threshold-plate overlapping the buffer and a spring whereby the threshold-plate is held in contact with the buffer, substantially as set forth.

16. The combination with the car-platform and the buffer, of a rocking threshold-plate pivotally supported between its front and rear edges and a spring bearing against the under side of the threshold-plate in rear of its pivotal support, substantially as set forth.

17. The combination with the car-platform and the buffer, of a transverse supporting-bar secured to the platform and having a convex upper side, a rocking threshold-plate resting between its front and rear edges upon said convex bar and a spring bearing against the under side of said plate in rear of said bar, substantially as set forth.

Witness my hand this 16th day of February, 1894.

LOUIS B. SMYSER.

Witnesses:

CASSIUS W. GOULD,
JOE E. WIDNER.