

(No Model.)

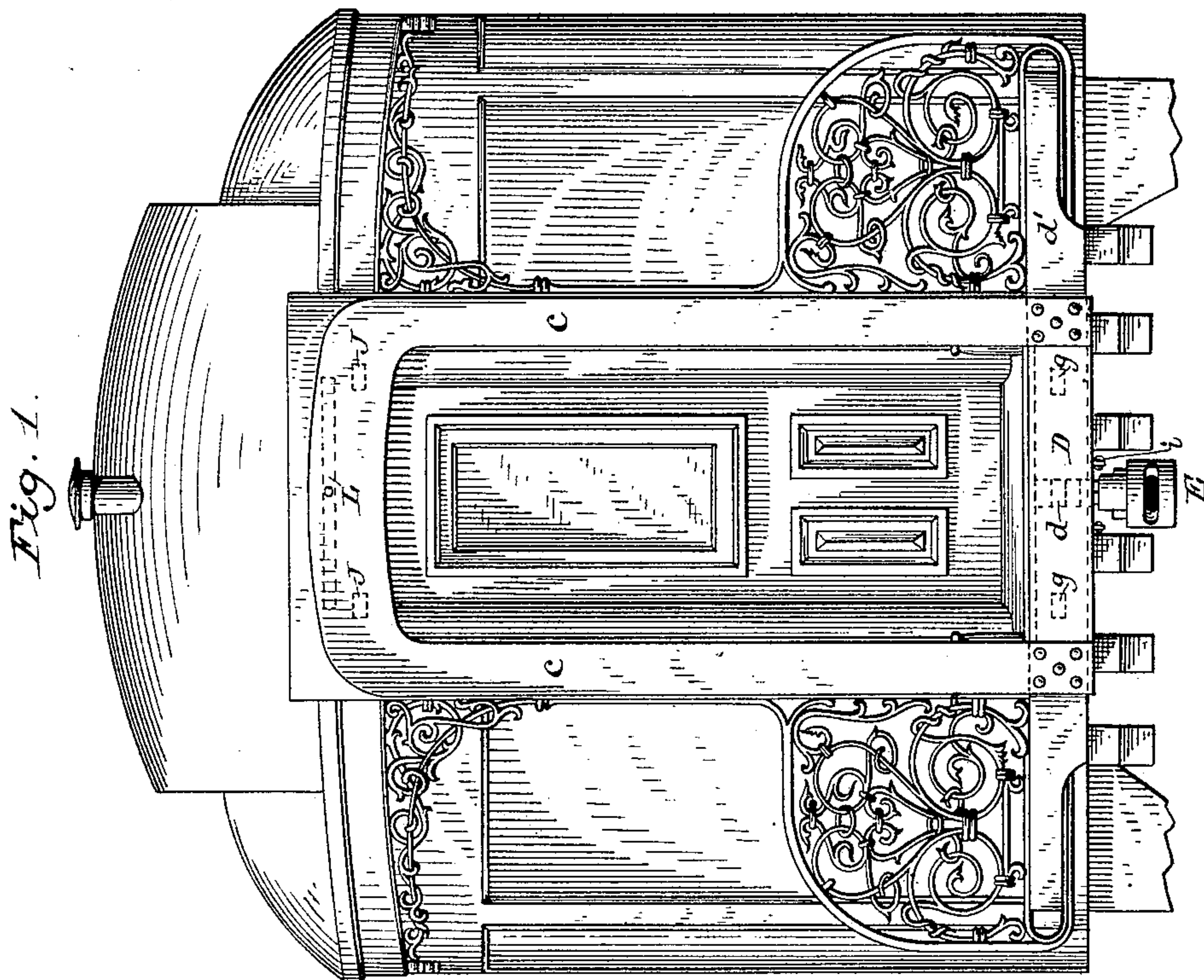
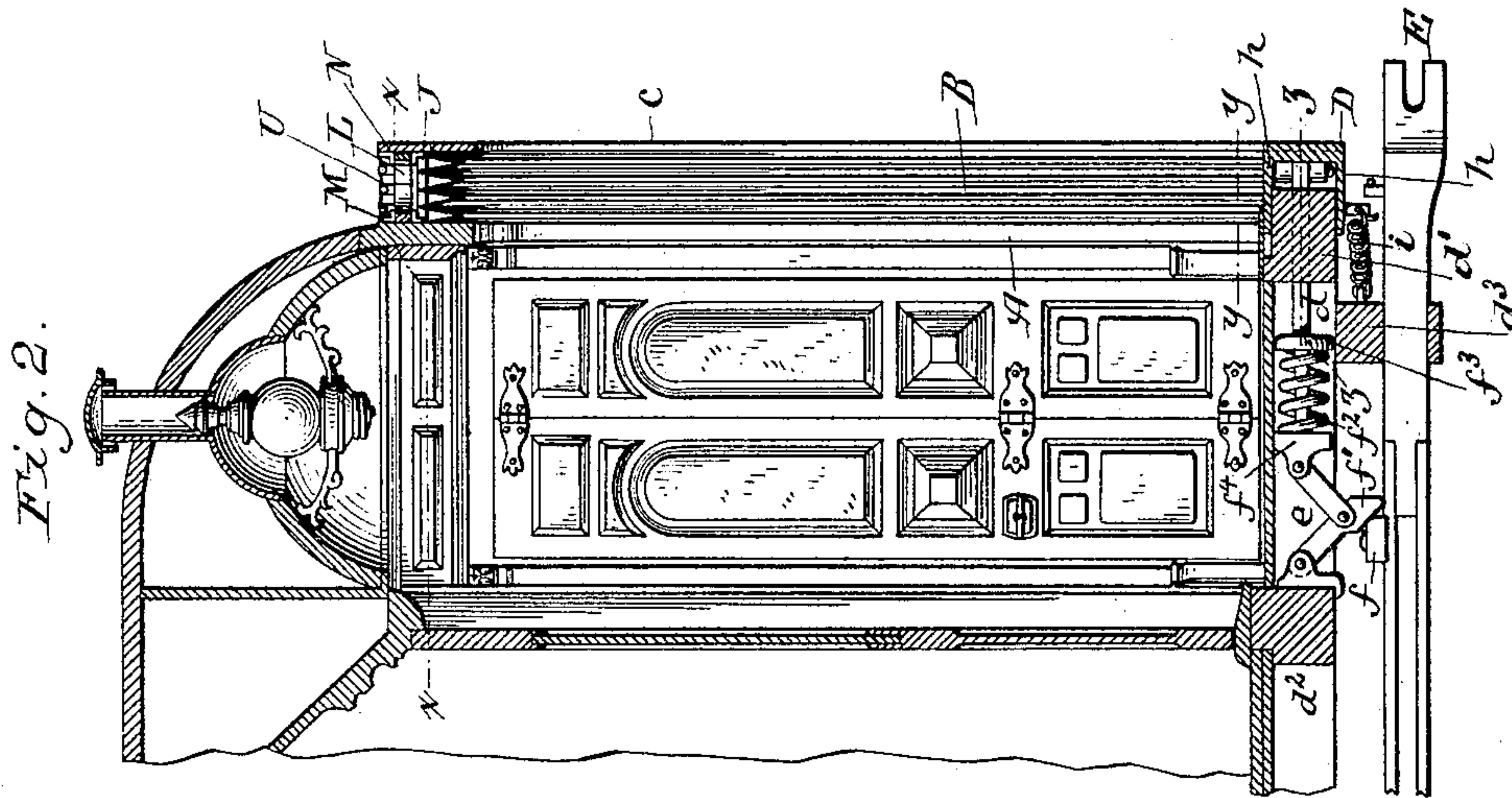
4 Sheets—Sheet 1.

T. A. BISSELL.

RAILWAY CAR.

No. 389,358.

Patented Sept. 11, 1888.



Chas. J. Buchheit.  
Theo. L. Popp. } Witnesses.

Thos. A. Bissell      Inventor.  
By Wilhelm Morner  
Attorneys.



(No Model.)

4 Sheets—Sheet 2.

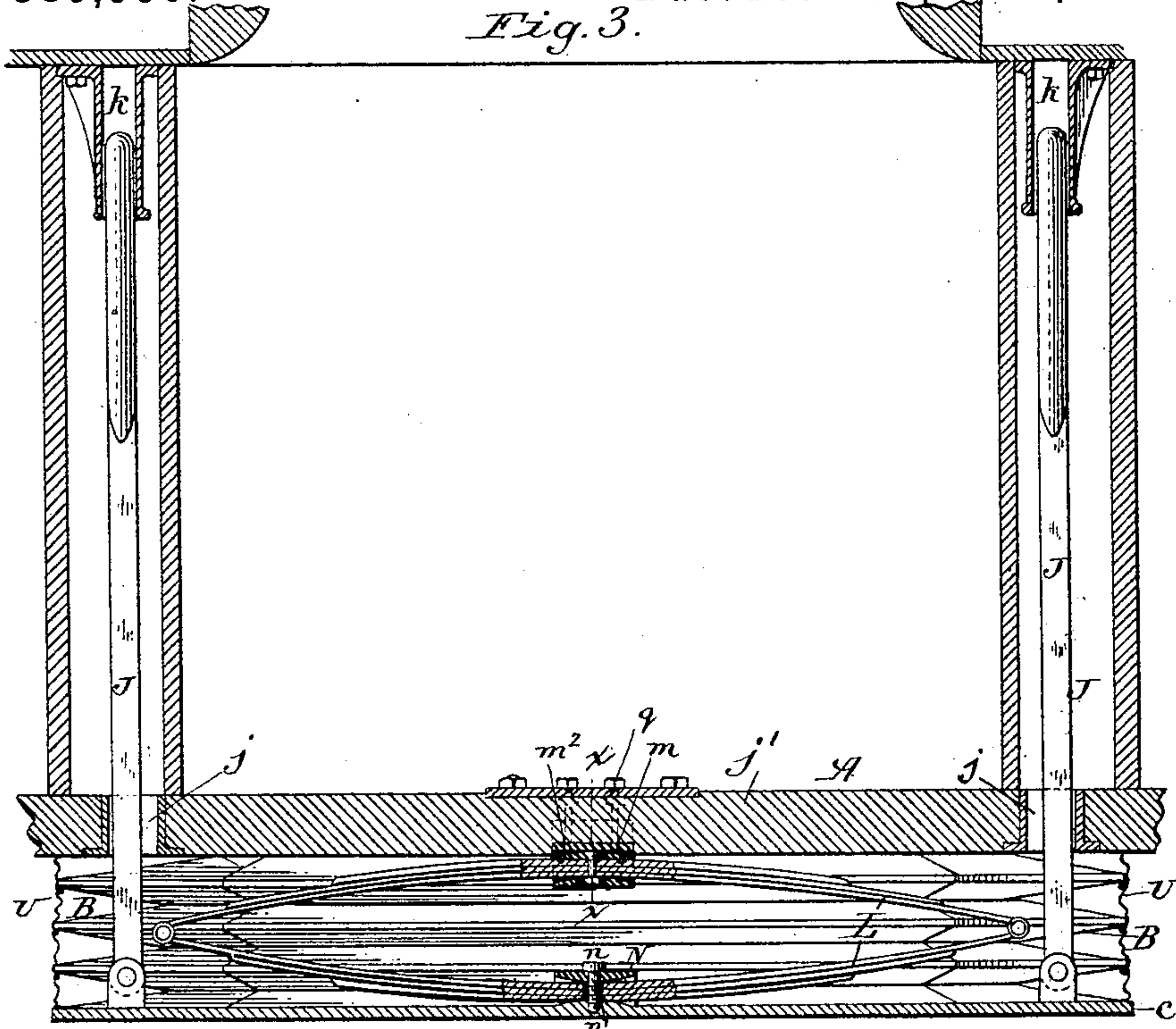
T. A. BISSELL.

RAILWAY CAR.

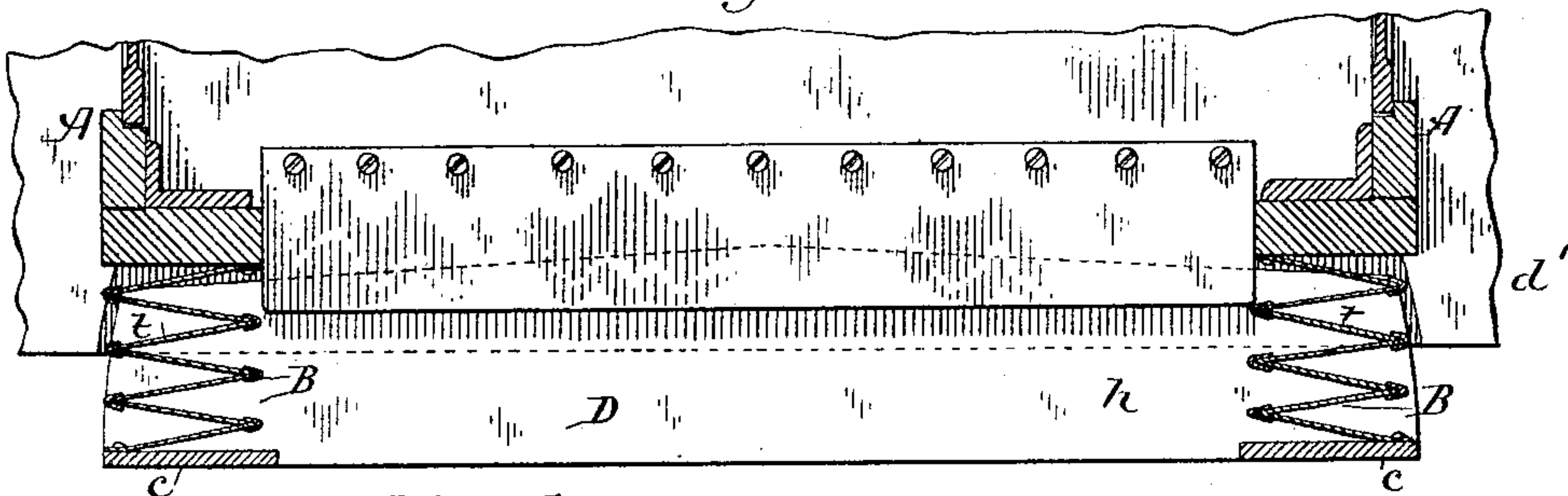
No. 389,358.

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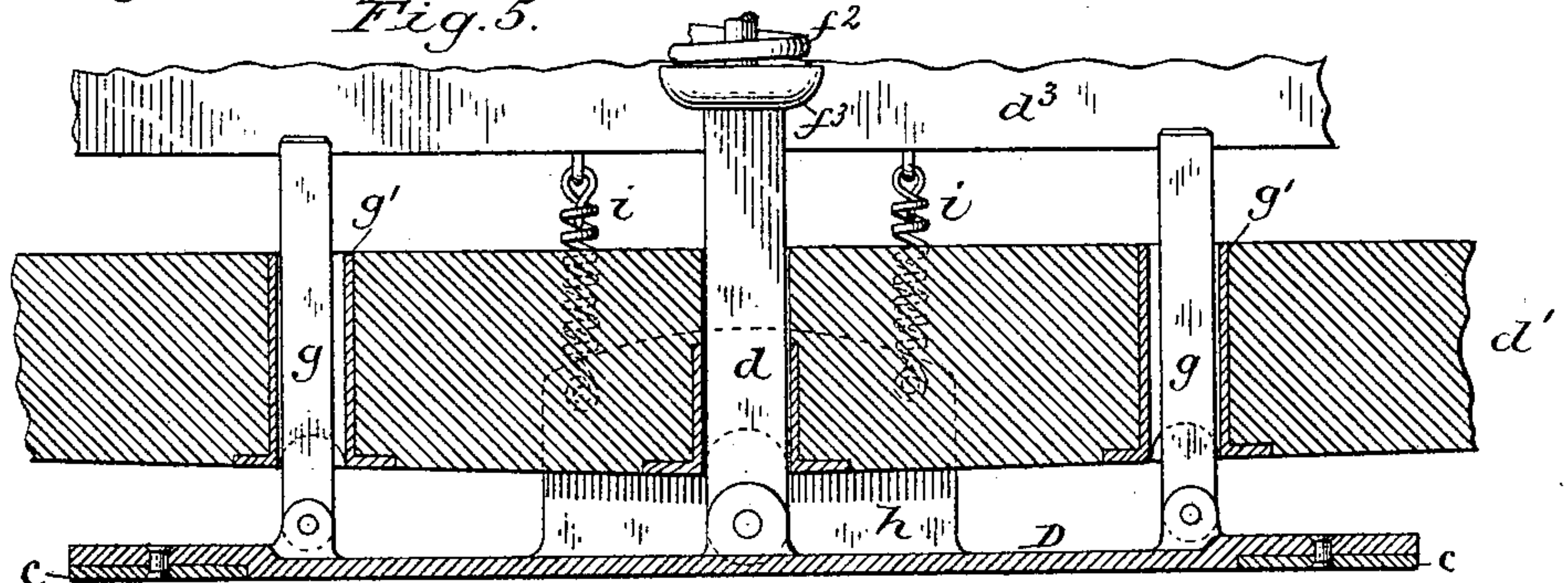
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



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Thos. L. Popp. Witnesses.

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(No Model.)

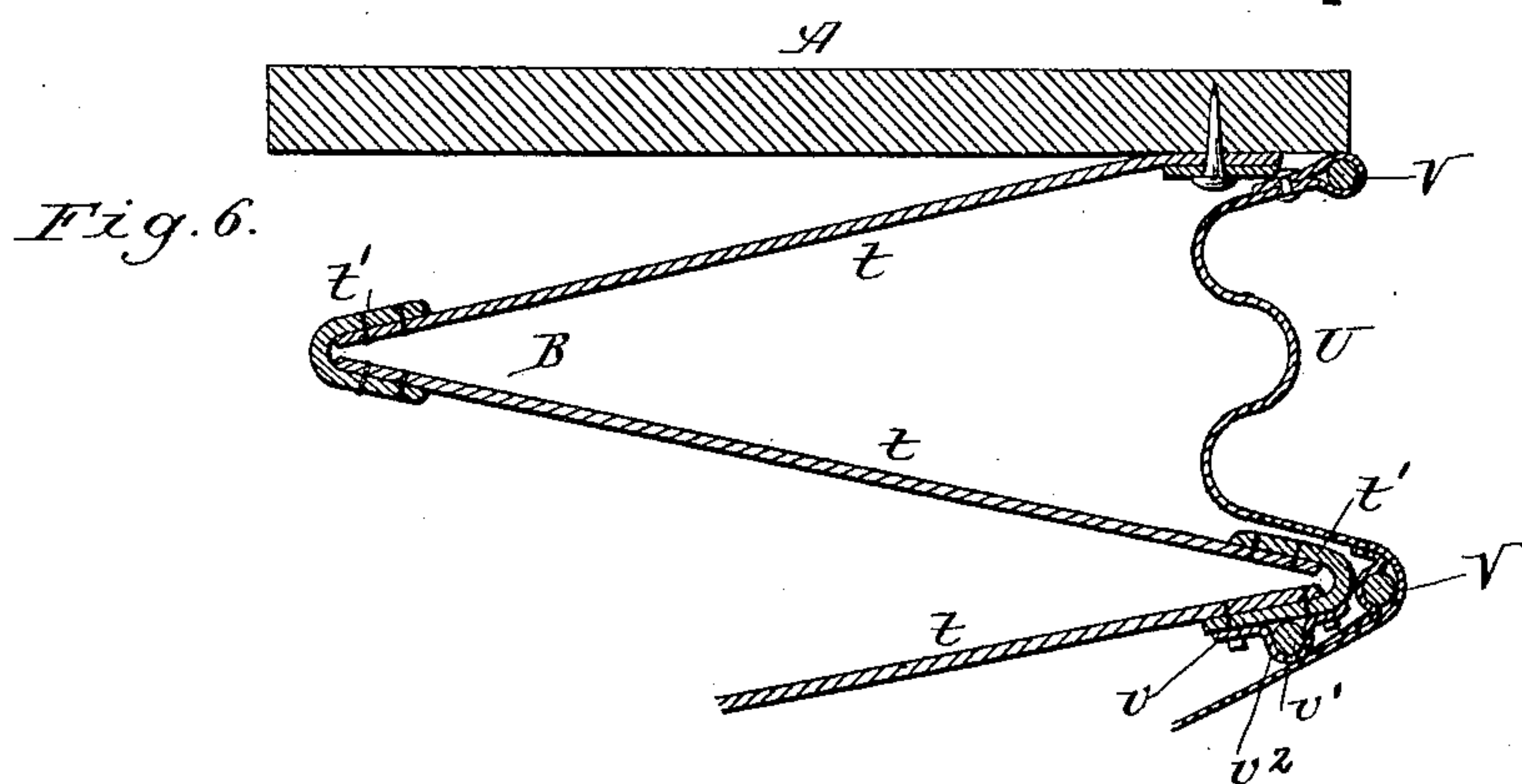
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T. A. BISSELL.

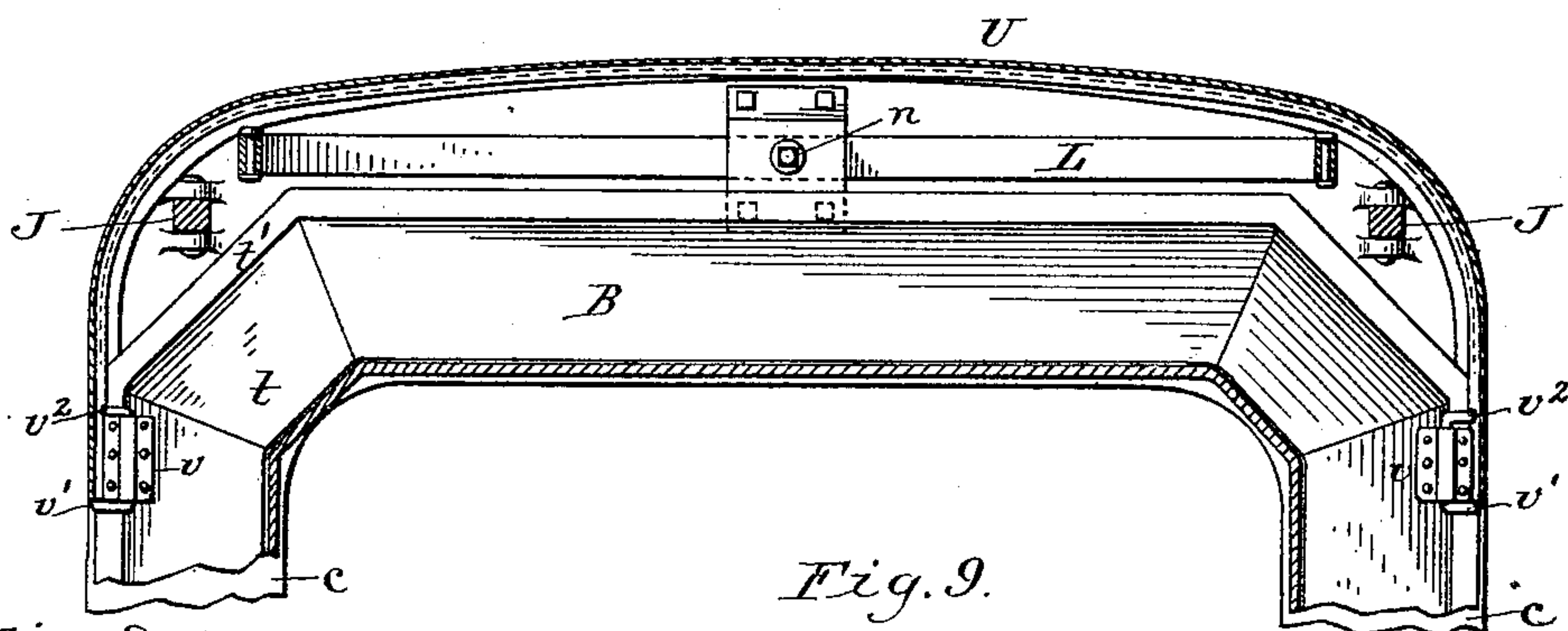
RAILWAY CAR.

No. 389,358.

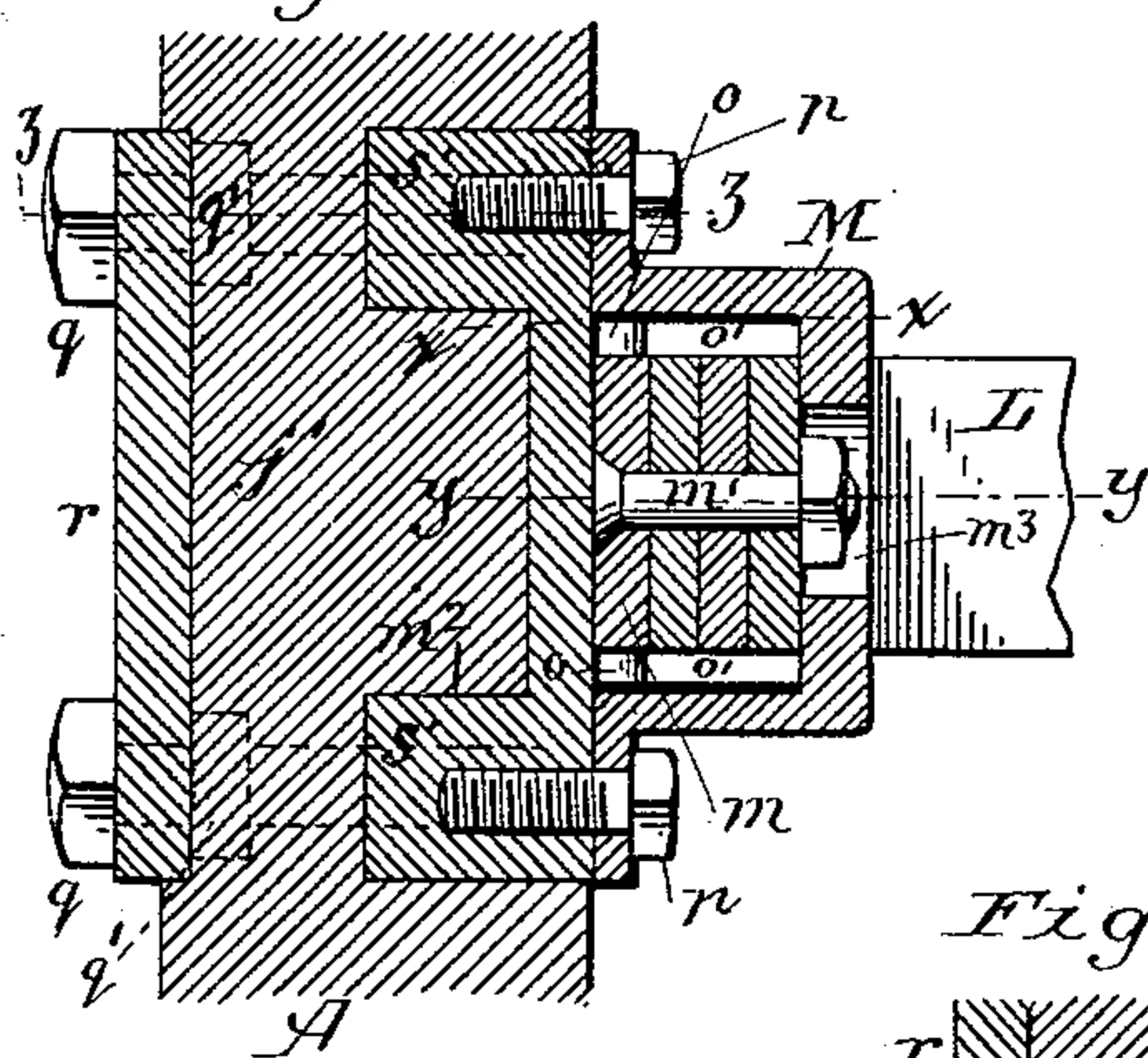
Patented Sept. 11, 1888.



*Fig. 7.*



*Fig. 8.*



*Fig. 9.*

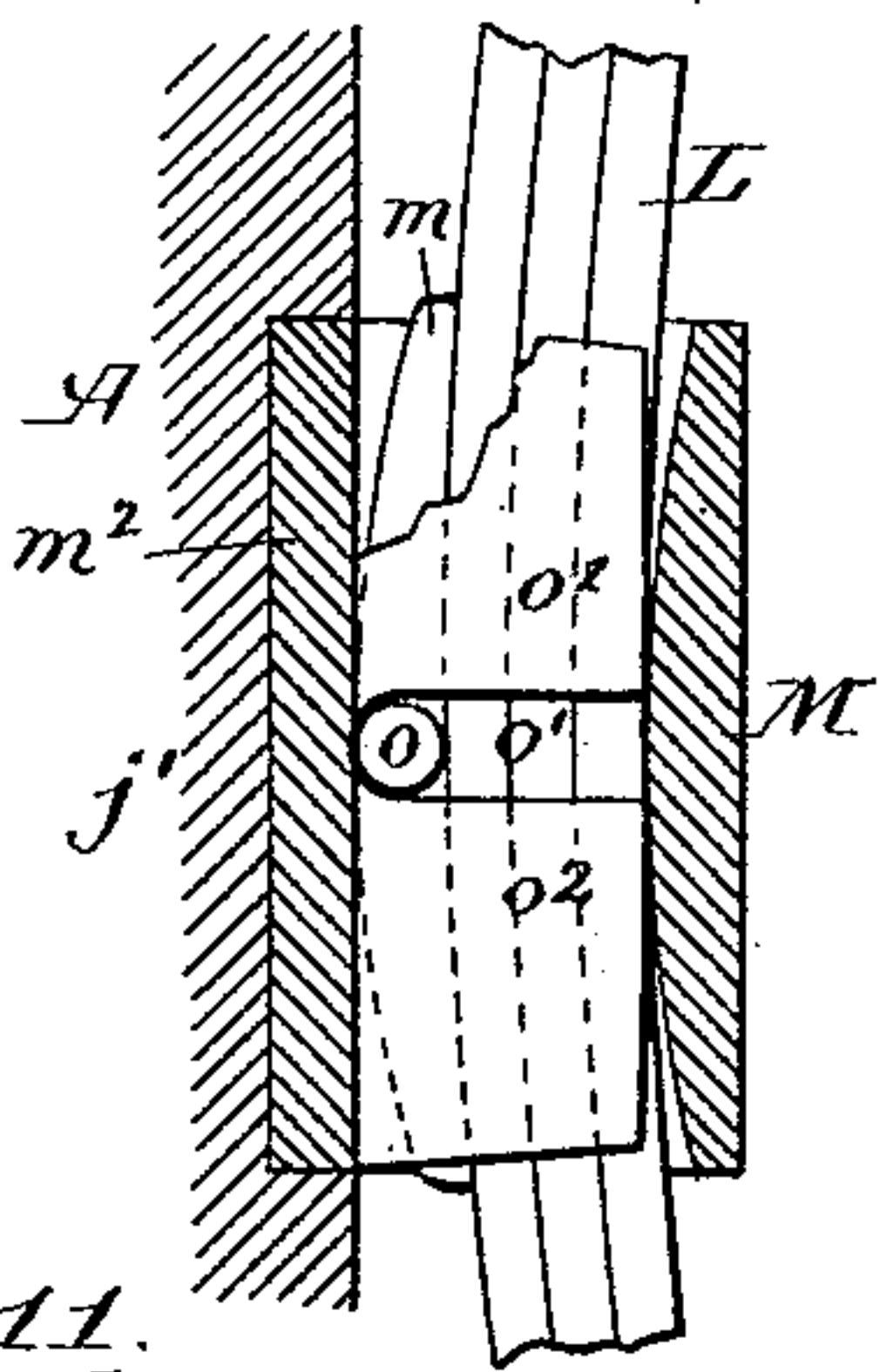


Fig. 10.

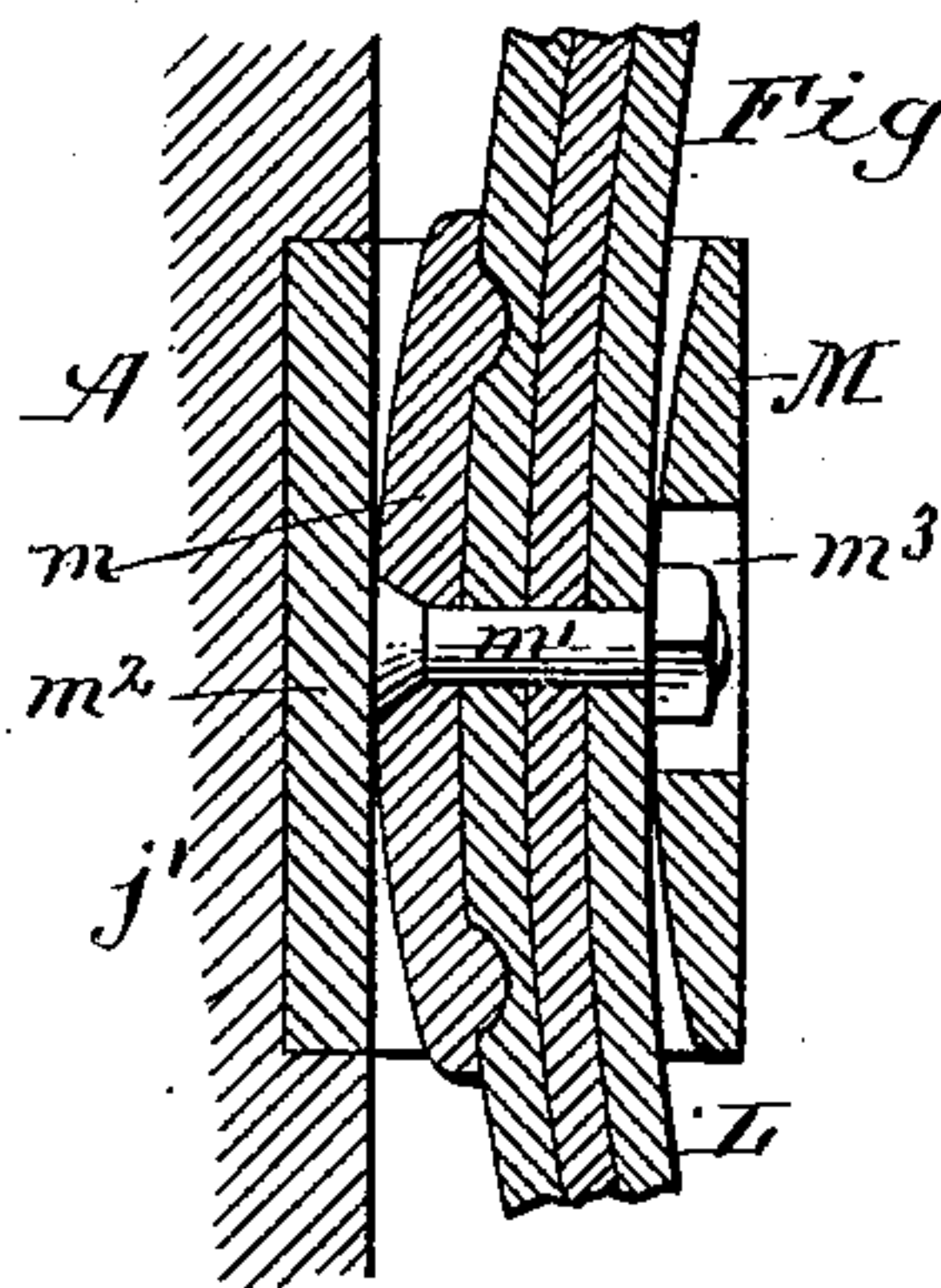
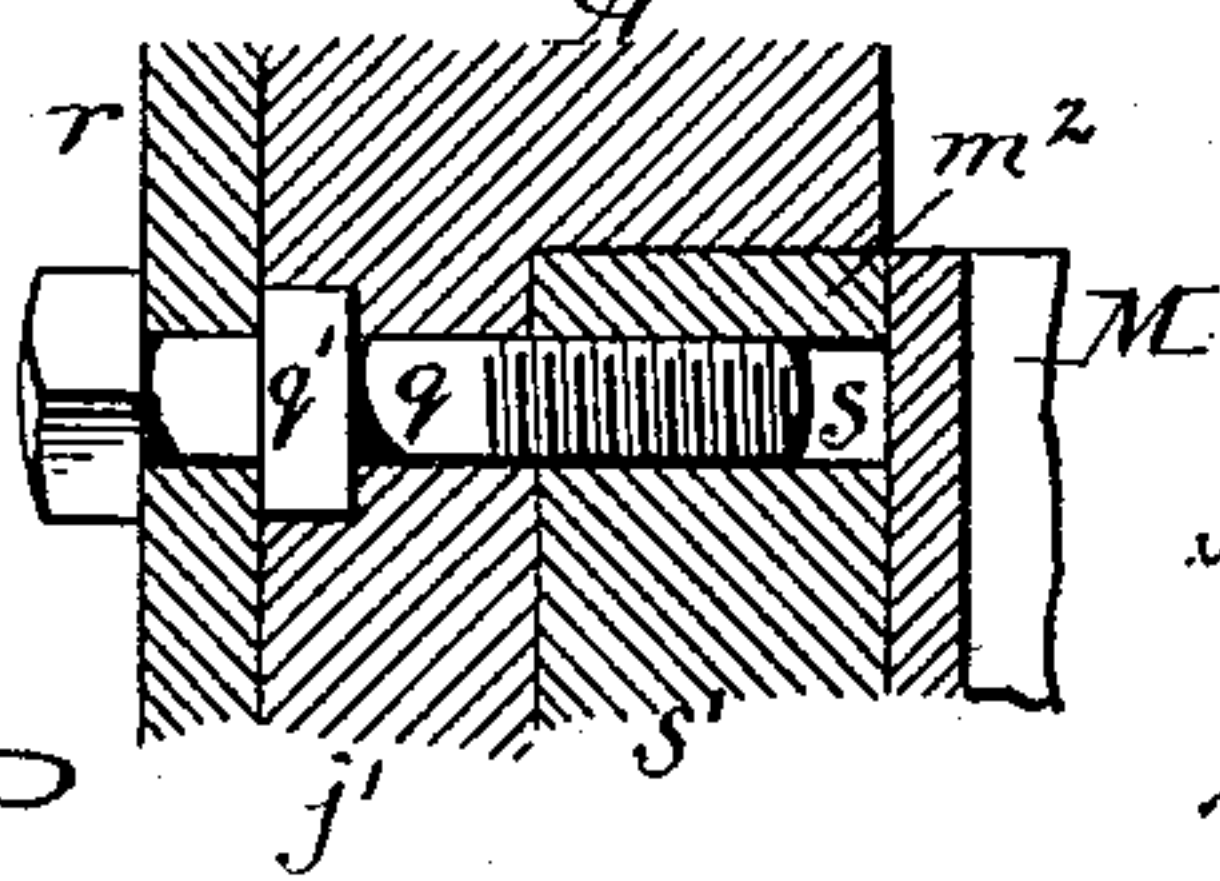


Fig. 11.



*Witnesses:*

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(No Model.)

4 Sheets—Sheet 4.

T. A. BISSELL.

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Fig. 12.

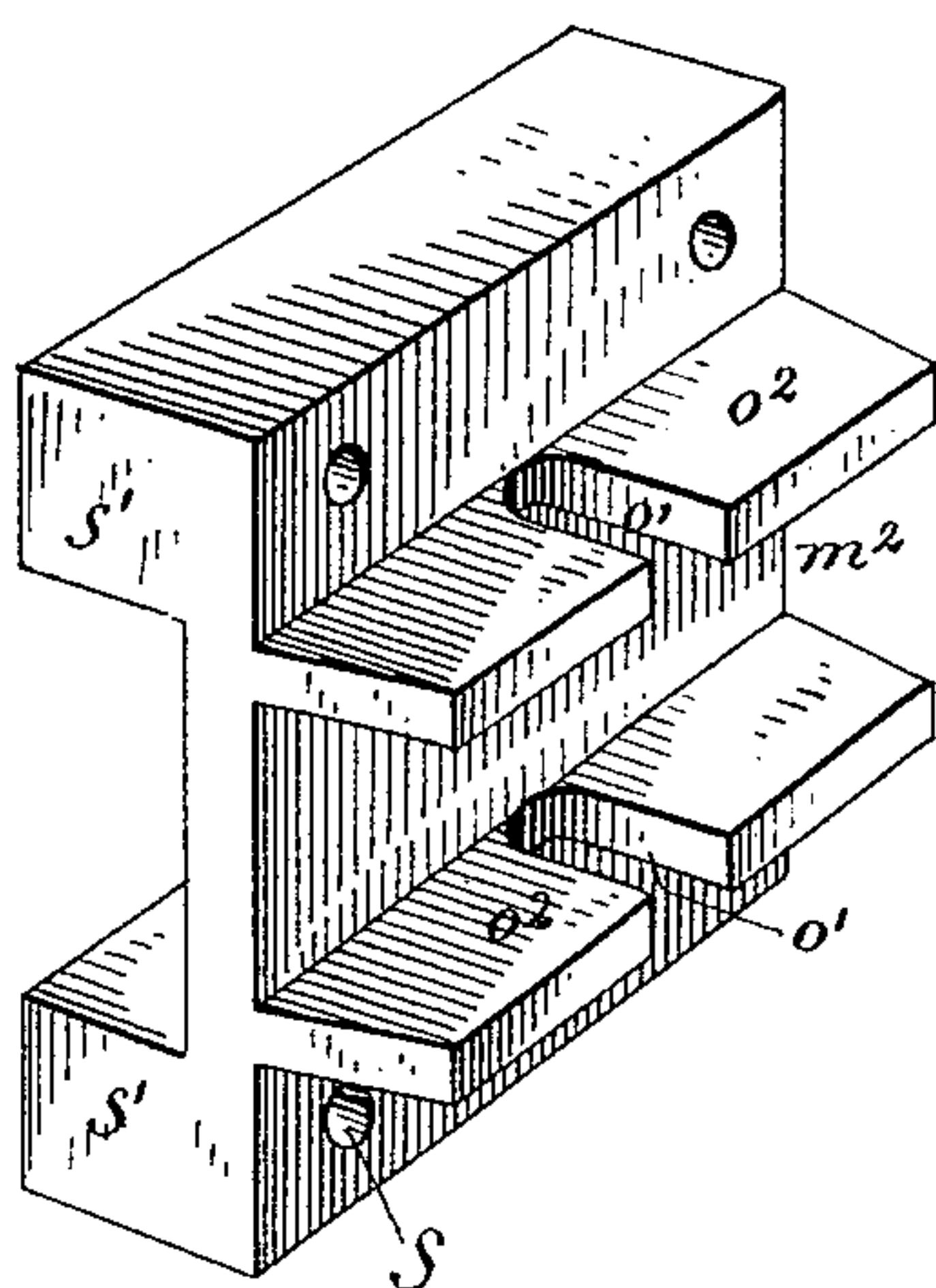


Fig. 13.

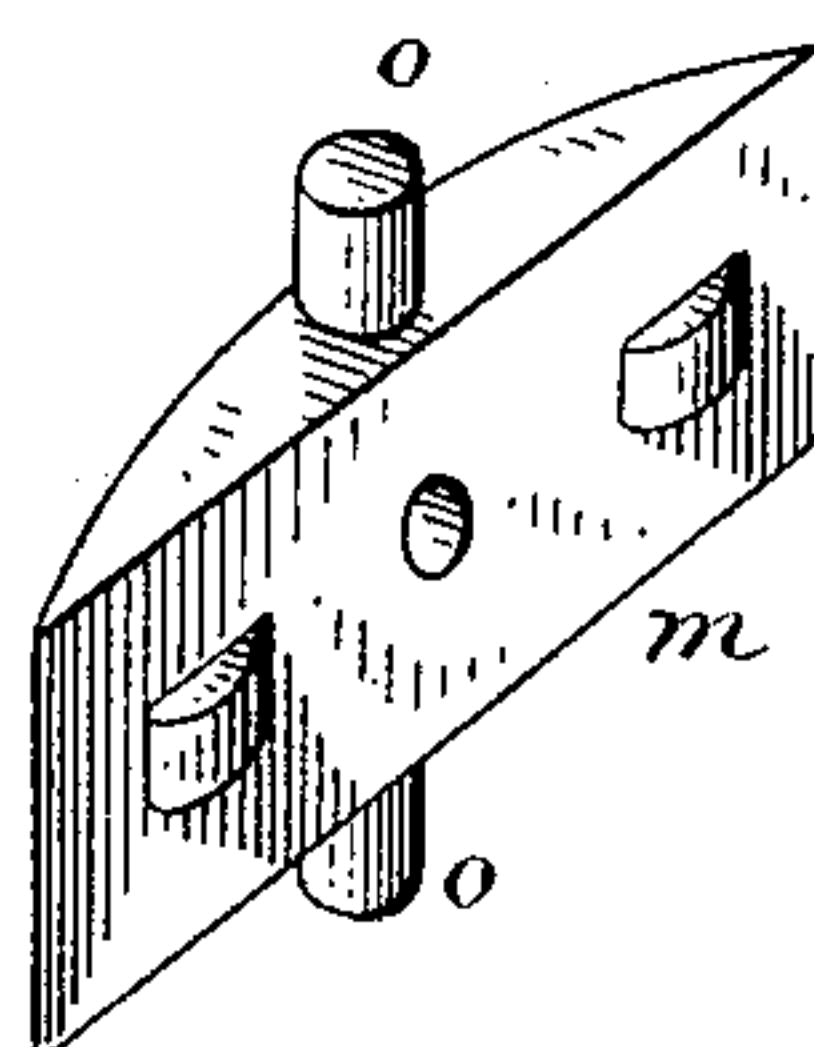


Fig. 15.

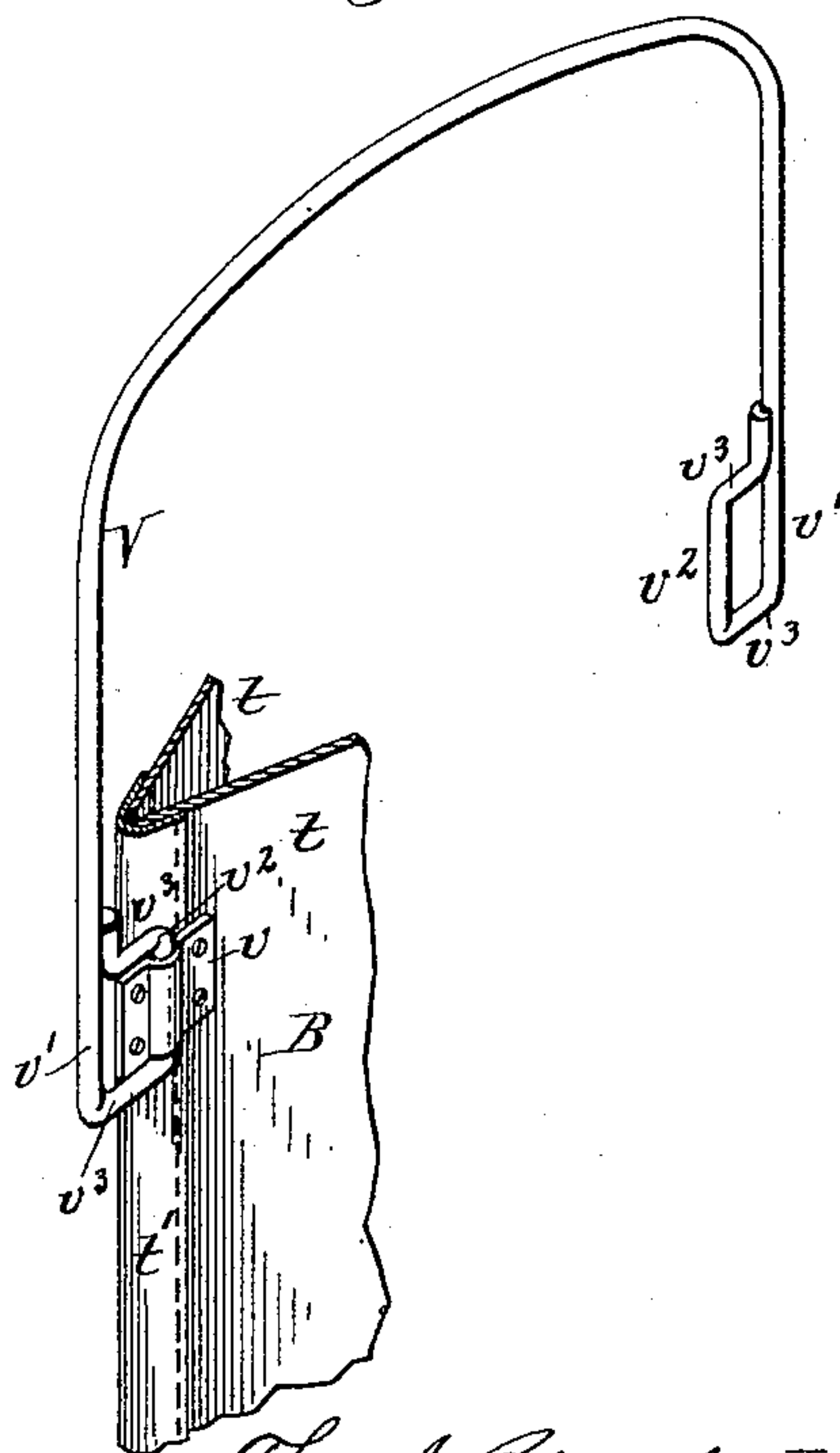
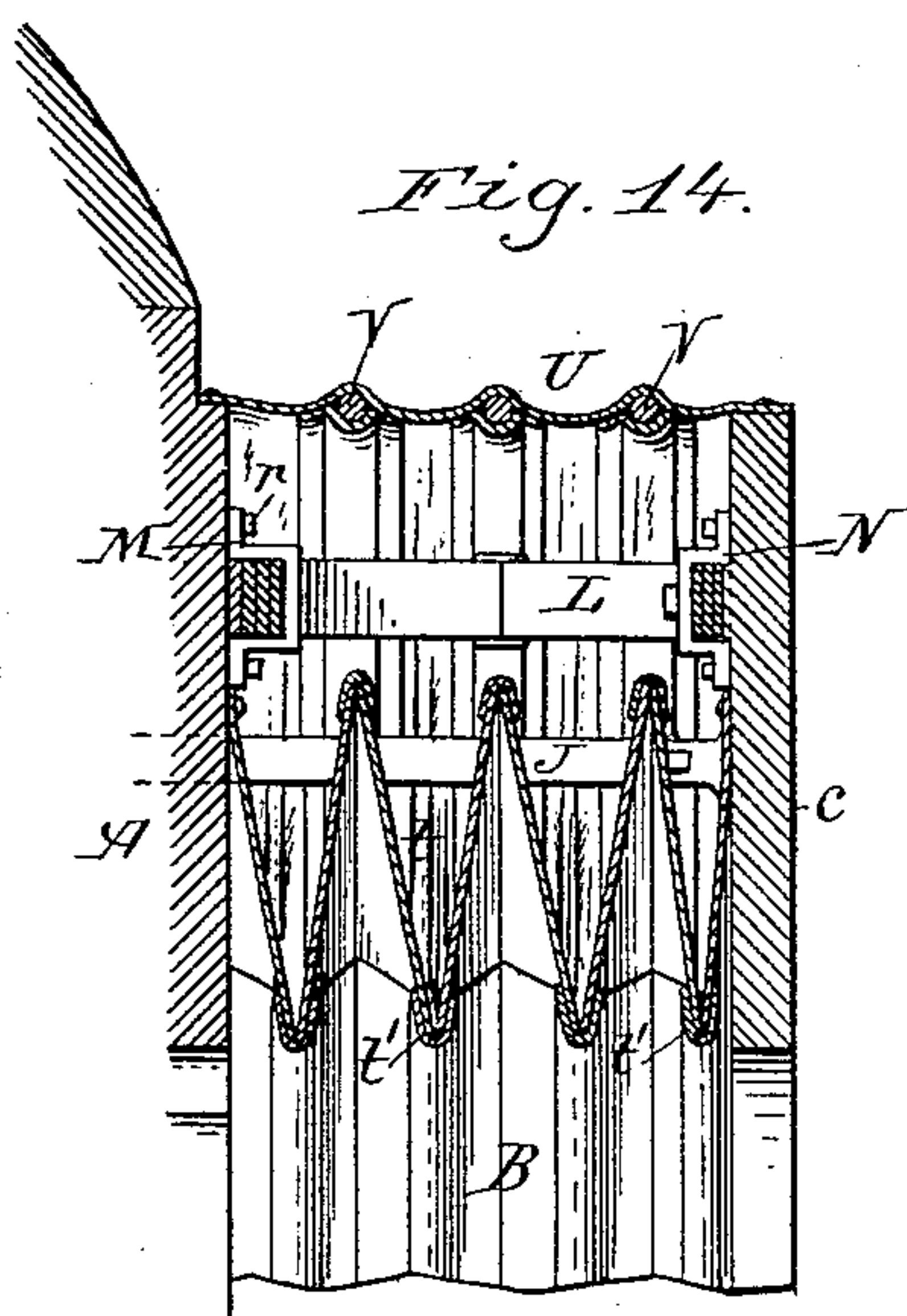


Fig. 14.



Witnesses:

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By Wilhelm H. Brown.  
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# UNITED STATES PATENT OFFICE.

THOMAS A. BISSELL, OF BUFFALO, NEW YORK.

## RAILWAY-CAR.

SPECIFICATION forming part of Letters Patent No. 389,358, dated September 11, 1888.

Application filed December 22, 1887. Serial No. 258,645. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS A. BISSELL, of the city of Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Railway-Cars, of which the following is a specification.

This invention relates to that class of railway-cars commonly known as "vestibule-cars," which are provided with flexible or extensible hoods, forming with hoods of adjoining cars a closed and continuous passage, through which the passengers can pass from one car to another without danger of accidents and without being exposed to the inconvenience of flying cinders, dust, snow, rain, &c. These flexible hoods, as heretofore constructed, offered considerable resistance to the progress of the train in passing over curves, owing to the fact that the expanding springs of the hoods were excessively compressed on the inner side of the curve. The outer springs were correspondingly released, resulting in a very unequal pressure on the hood-frame.

The object of my invention is to provide the hoods with springs which will readily adapt themselves to the position of the cars in passing curves, so as to distribute the strain equally upon the springs at all times, and thereby reduce the resistance to a minimum.

My invention has the further object to provide the main hood with a protecting auxiliary hood and to improve the construction of these hoods in other particulars.

My invention consists of the improvements which will be hereinafter fully described, and pointed out in the claims.

In the accompanying drawings, consisting of four sheets, Figure 1 is an end elevation of a car provided with my improvements. Fig. 2 is a longitudinal sectional elevation of one end of the car. Fig. 3 is a horizontal section, on an enlarged scale, in line  $x x$ , Fig. 2. Fig. 4 is a similar view in line  $y y$ , Fig. 2. Fig. 5 is a horizontal section in line  $z z$ , Fig. 2, on an enlarged scale. Fig. 6 is a horizontal section, on an enlarged scale, of a portion of the flexible hood. Fig. 7 is a transverse section, on an enlarged scale, of the upper portion of the hood. Fig. 8 is a longitudinal section, on an enlarged scale, in line  $x x$ , Fig. 3. Figs. 9 and 10 are horizontal sections in lines  $x x$  and  $y y$ , Fig. 8, respectively. Fig. 11 is a fragmentary hori-

zontal section in line  $z z$ , Fig. 8, showing the manner of adjusting the tension of the spring. Fig. 12 is a perspective view of the adjustable plate to which the clip is attached. Fig. 13 is a perspective view of the curved plate secured to the elliptical spring. Fig. 14 is a longitudinal section, on an enlarged scale, of the upper portion of the hood. Fig. 15 is a perspective view of a portion of the main hood and one of the frames supporting the auxiliary hood.

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

A represents the open end frame or wall of the vestibule, and B is the flexible or extensible hood secured with its inner end to the end frame, A. The outer end of the hood B is secured to a vertical rectangular frame,  $c$ , which latter is secured with its lower end to a horizontally-movable plate, D, forming the lower cross-piece of the hood-frame. The plate D is pivoted centrally to the outer end of a horizontal rod or bar,  $d$ , which slides in an opening formed in the outer horizontal end timber or cross-piece,  $d'$ , of the platform of the car.

$e$  is a toggle-joint connecting the inner end of the sliding bar  $d$  with the inner cross-timber  $d''$  of the platform.

E is the draw-bar arranged below the platform of the car, and which may be of any ordinary construction. The draw-bar E is provided on its upper side with a block or projection,  $f$ , which bears against a nose or projection,  $f'$ , formed at the center of the toggle-joint  $e$ .

$f^2$  is a spiral spring surrounding the sliding rod  $d$  and interposed between a collar,  $f^3$ , on the rod and a block,  $f^4$ , attached to the adjacent bar of the toggle-joint. This spring serves to keep the nose  $f'$  of the toggle-joint in contact with the block  $f$  of the draw-bar. When the draw-bar E is drawn outwardly by the resistance of the cars in starting or in going up grades, the projection  $f$ , bearing against the nose  $f'$  of the toggle-joint, tends to straighten the latter, thereby moving the sliding rod  $d$  and plate D outwardly and keeping the latter in constant contact with the plate D of the adjacent car. By this means the lower ends of the adjoining hoods are caused to bear against each other at all times, even when the platforms of the cars are separated to an unusual extent, the toggle-joint being straightened



to a greater or less extent and the plate D moved outwardly in the same measure as the draw-bar is pulled outwardly. As the plate D is pivoted at its center, the lower end of the hood can accommodate itself to the position of the car in turning curves.

$g g$  represent horizontal supporting-bars pivoted with their outer ends to the outer portions of the plate D, and sliding in openings or sockets  $g' g'$ , formed in the cross-piece  $d'$ .

$h h$  represent lips or flanges formed on the upper and lower sides of the plate D and bearing against the upper and lower sides of the cross-piece  $d'$ . These lips aid in guiding the plate D upon the cross-piece  $d'$ .

$i i$  are light springs arranged on opposite sides of the center of the plate D, and secured with one end to the lower lip,  $h$ , and with their opposite ends to a cross-piece,  $d^3$ . These springs retain the plate D in a position parallel with the end of the car when the latter is disconnected from other cars, and thereby hold the hood in its proper position.

$J J$  represent horizontal rods or bars which guide and support the upper end of the frame  $c$ , and which pass through elongated openings  $j$ , formed in the upper cross-piece,  $j'$ , of the end frame, A, of the vestibule. These rods are guided at their inner ends in sockets  $k$ , secured to the end wall of the car, the sockets  $k$  and supporting-bars  $J$  being concealed by a suitable casing, as shown in Fig. 3. The bars  $J J$  are pivoted at their front ends to the frame  $c$ , so that the frame can change its position with reference to the end of the vestibule when the car runs around curves, the sockets  $k$  being made large enough to permit of the proper play of the bars  $J J$ .

$L$  represents an elliptical spring arranged transversely above the hood B and interposed between the upper end of the frame  $c$  and the adjacent end frame, A, whereby the upper end of the frame  $c$  is extended or forced outwardly. The inner member of the extending spring  $L$  is attached to the end wall, A, by a connection which permits the spring a limited lateral movement, and the outer member of the spring is loosely fitted in a clip, N, secured to the upper portion of the frame  $c$ , so that the spring can rock or oscillate and accommodate itself to the position or angle of the hood-frame.

$M$  represents a clip which straddles the inner member of the spring.

$m$  represents a curved plate secured to the rear side of the inner member of the spring  $L$  by a bolt,  $m'$ , and bearing against a plate,  $m^2$ , made lengthwise adjustable in the end wall, A. The inner end of the bolt  $m'$  is countersunk in the plate  $m$ , and its nut is arranged in an elongated opening,  $m^3$ , formed in the upright bar of the clip, so as to afford the bolt the required play in the rocking movements of the spring.

$o o$  represent vertical studs or pivots formed on the upper and lower sides of the curved plate  $m$  and engaging in slots  $o'$ , arranged in horizontal flanges or lips  $o^2$ , formed on the

plate  $m^2$ . By this construction the spring is held against lateral movement in the clip while being permitted to swing on the pivots  $o$ . The clip  $M$  straddles the spring, and is secured with its ends to the adjustable plate  $m^2$  by bolts  $p$ , passing through ears formed on the ends of the clip.

$q$  represents horizontal bolts, which are attached to a plate,  $r$ , secured to the inner side of the end wall, A, and in which the bolts are held against longitudinal movement by collars  $q'$ , formed on the bolts and bearing against the inner side of the plate  $r$ , as shown in Figs. 8 and 11. The inner ends of the bolts  $q$  work in screw-threaded openings  $s$ , formed in the rear side of the plate  $m^2$ , so that upon turning the bolts  $q$  in the proper direction the plate  $m^2$  and the clip  $M$  will be moved outwardly, thereby moving the inner member of the spring outwardly toward the frame  $c$  and increasing its tension. The screw-threaded openings  $s$  are arranged in horizontal ribs  $s'$ , formed on the plate  $m^2$ , and these ribs are arranged in suitable recesses formed in the end wall, A.

The clip  $N$  is secured to the frame  $c$  by a horizontal bolt,  $n$ , and is provided with a curved seat,  $n'$ , for the spring, as shown in Fig. 3. The opening in the spring through which the bolt  $n$  passes is made flaring outwardly from the center toward both ends to permit of the proper play of the spring on the bolt.

By attaching the transverse spring to the end of the wall of the vestibule by a laterally-rocking connection the spring is enabled to retain its normal position with the hood-frame when the latter assumes a position transversely at an angle to the car-body in passing through curves, thereby enabling the cars to pass through curves without materially compressing the spring and preventing excessive compression of the spring and the undue resistance resulting therefrom.

The hood B is constructed like the flexible portion of an accordion or bellows, and is composed of sections,  $t$ , of cotton belting or other similar material. These sections are connected together at their ends by narrow strips  $t'$ , of leather, which are preferably sewed to the adjacent sections, as clearly shown in Fig. 6.

$U$  represents an auxiliary extensible hood or shield arranged above the hood B, and serving to protect the latter and the spring  $L$  from water, snow, ice, &c. The auxiliary hood  $U$  is preferably composed of ducking, and its ends are secured, respectively, to the end wall, A, and frame  $c$ .

$V$  represents frames or bows, which support the auxiliary hood  $U$ , and are secured with their lower ends to the outer portions of the folds of the main hood B by means of straps or plates  $v$ , as clearly shown in Fig. 15. The bows  $V$  are composed of steel rods, and their lower ends are bent to form loops  $v'$ . The inner bars,  $v^2$ , of these loops are seated in depressions formed in the straps  $v$ , and the upper and lower cross-bars,  $v^3$ , of these loops



bear against the adjacent ends of the straps *v* and hold the bows *V* in place. A supporting-bow, *V*, is preferably arranged in each fold of the auxiliary hood, as shown. These bows, being constructed of steel rods, possess sufficient elasticity to permit the auxiliary hood to be extended from the main hood *B*.

I claim as my invention—

1. The combination, with the end wall of the vestibule or car, an extensible hood secured to said end wall, and a vertical frame secured to said hood, of a transverse spring attached with its outer portion to the hood-frame, and a rocking connection, whereby the inner portion of the spring is centrally attached to said wall, and whereby the spring is enabled to rock laterally and adapt itself to the angle of the hood-frame, substantially as set forth.

2. The combination, with the end wall, *A*, hood *B*, and hood-frame *c*, of a transverse spring arranged between the wall *A* and the upper portion of the frame *c*, a plate, *m*, secured to the spring and provided with vertical pivots *o*, and a clip, *M*, attached to the wall *A*, and provided with longitudinal slots *o'*, in which said pivots engage, substantially as set forth.

3. The combination, with the end wall, *A*,

and the spring *L*, of a clip, *M*, in which the spring is loosely fitted, an adjustable plate, *m*<sup>2</sup>, seated in the end wall, *A*, and to which the clip *M* is secured, and horizontal adjusting-screws held against longitudinal movement in the end wall and engaging in screw-threaded openings in the plate *m*<sup>2</sup>, substantially as set forth.

4. The combination, with the end wall, *A*, the extensible main hood *B*, and the hood-frame *c*, of an auxiliary hood secured to said end wall and said hood-frame above the main hood, and a spring interposed between said wall and said hood-frame between the main hood and the auxiliary hood, substantially as set forth.

5. The combination, with the main hood *B* and the auxiliary hood *U*, arranged above the same, of elastic bows or frames *V*, supporting the hood *U*, and provided at their lower ends with loops *v'* and a strap or plate, *v*, whereby said loops are secured to the folds of the main hood *B*, substantially as set forth.

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Witnesses:

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