

F. KENNINGTON.
ADJUSTABLE ROOF OR COVER FOR TRAM CARS.

(Application filed Jan. 21, 1902.)

(No Model.)

2 Sheets—Sheet 1.

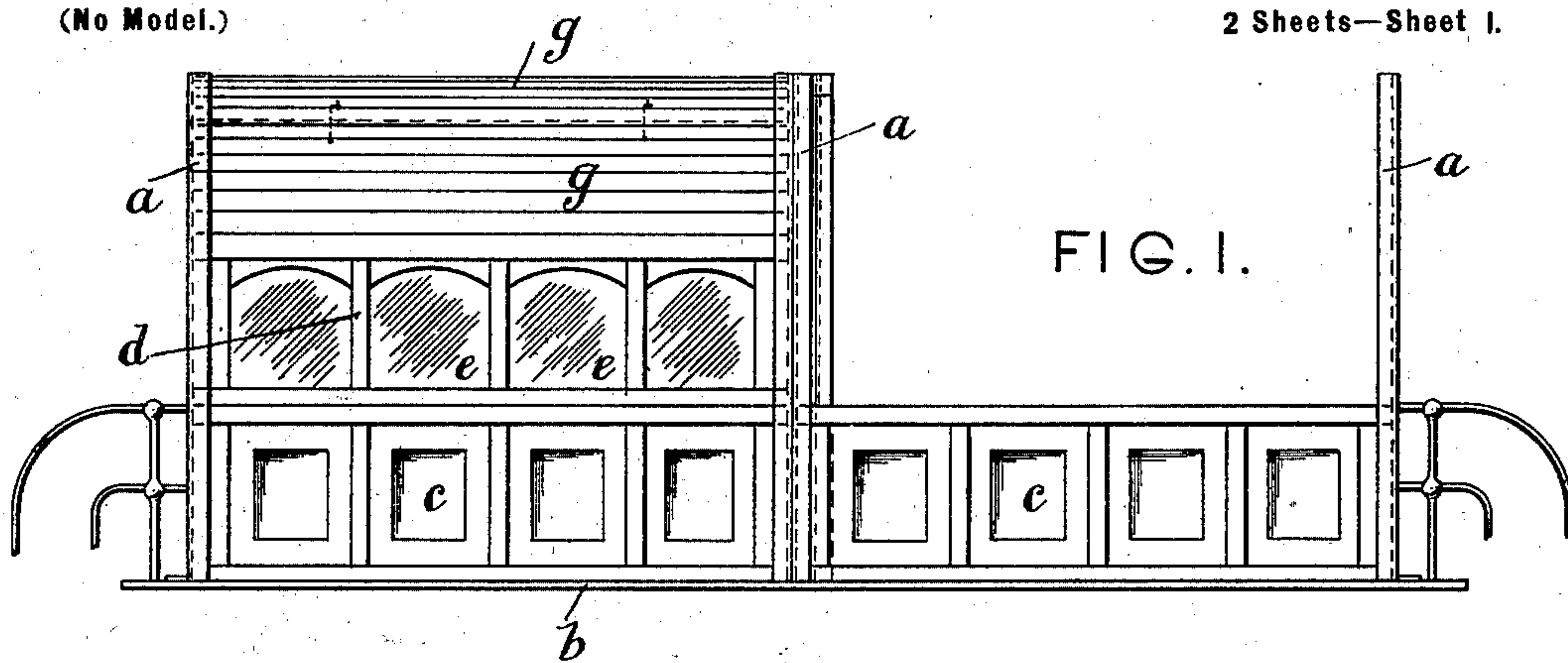


FIG. 1.

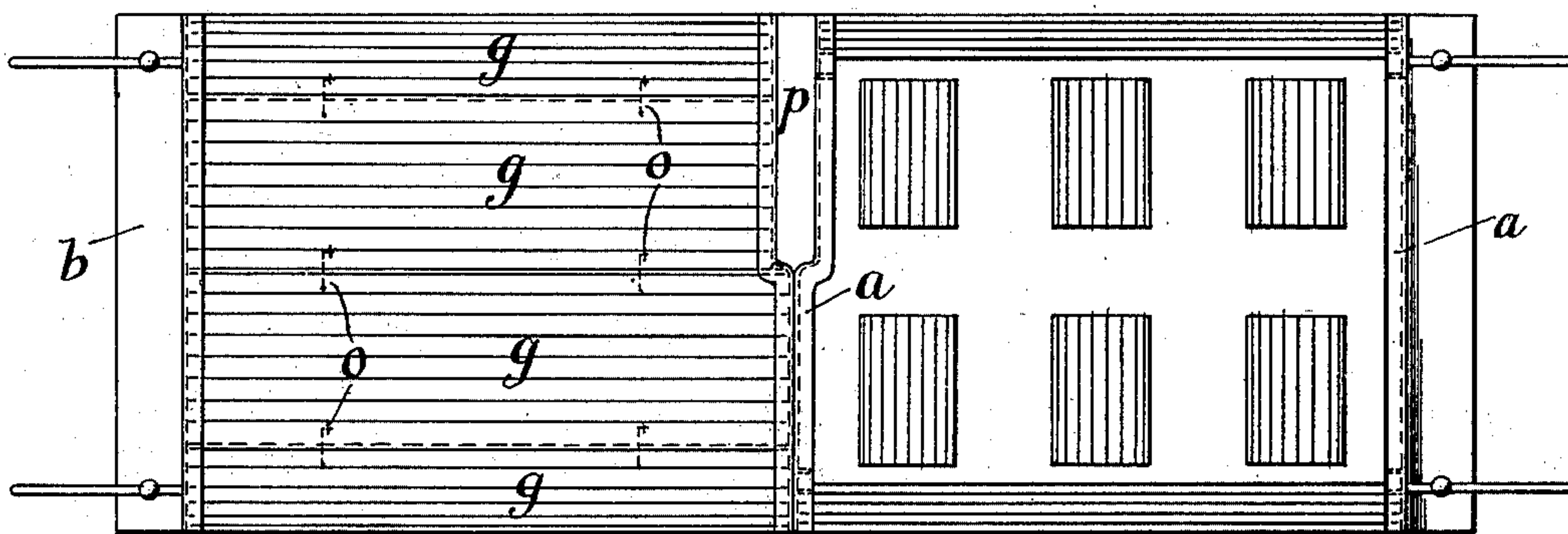


FIG. 2.

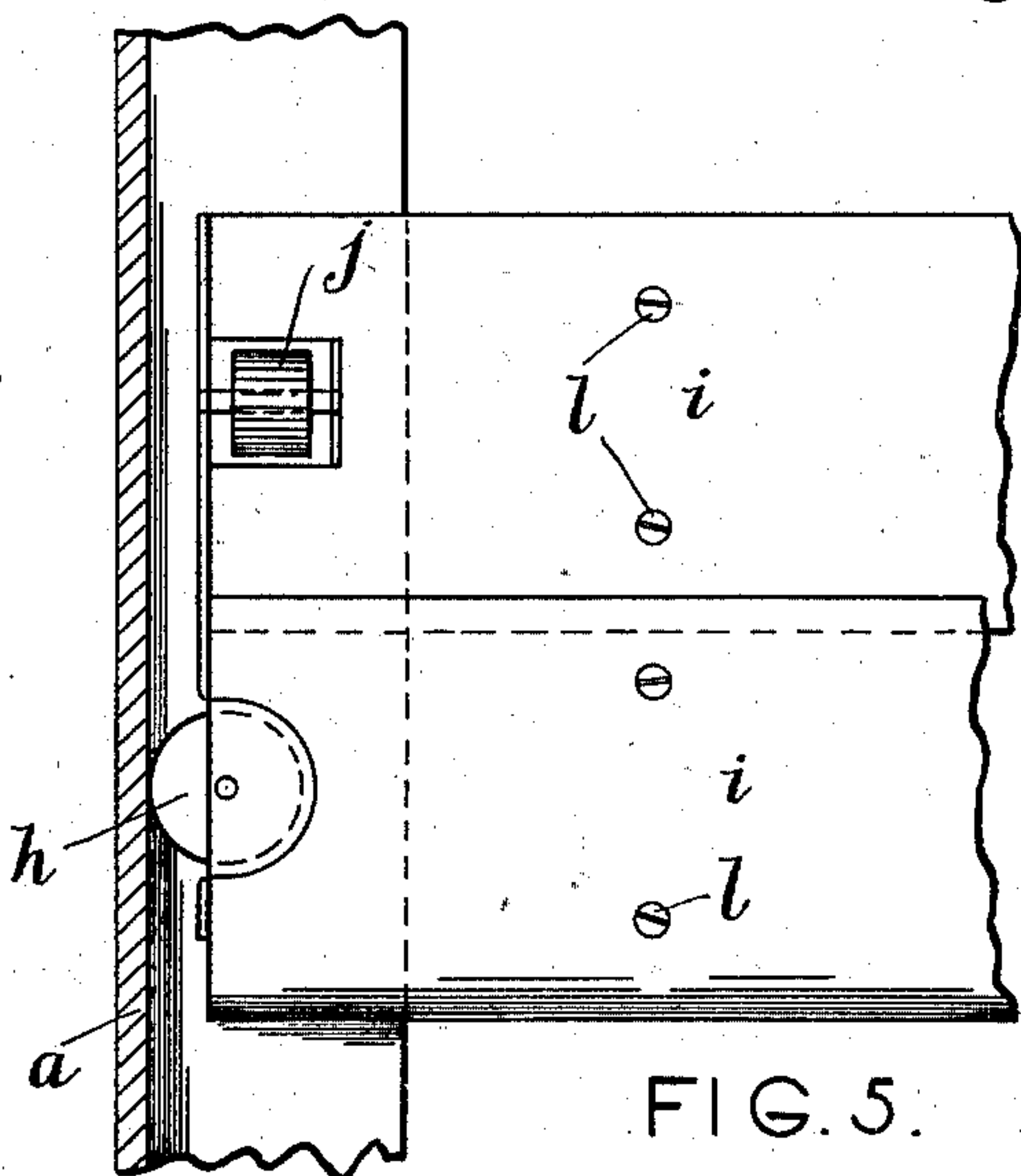


FIG. 5.

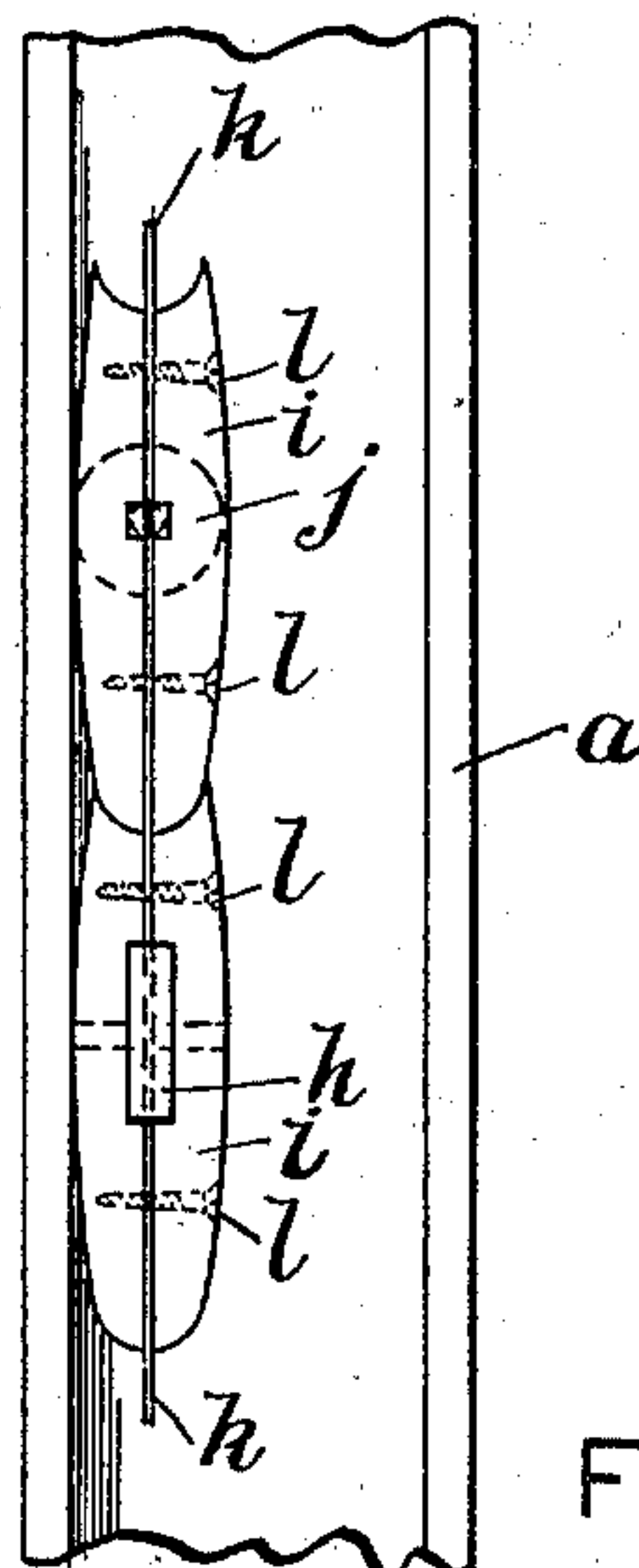


FIG. 6.

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No. 698,518.

Patented Apr. 29, 1902.

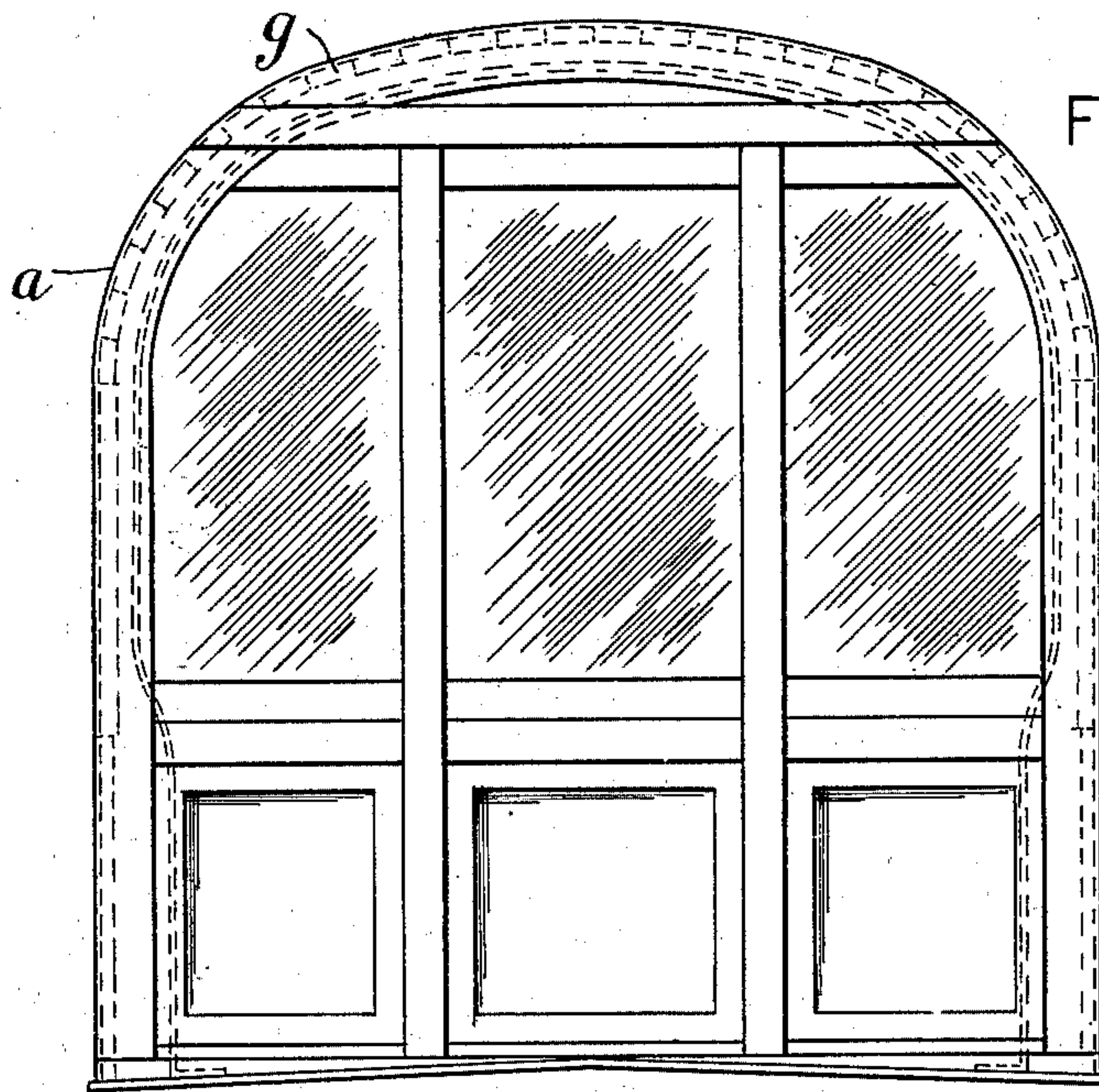
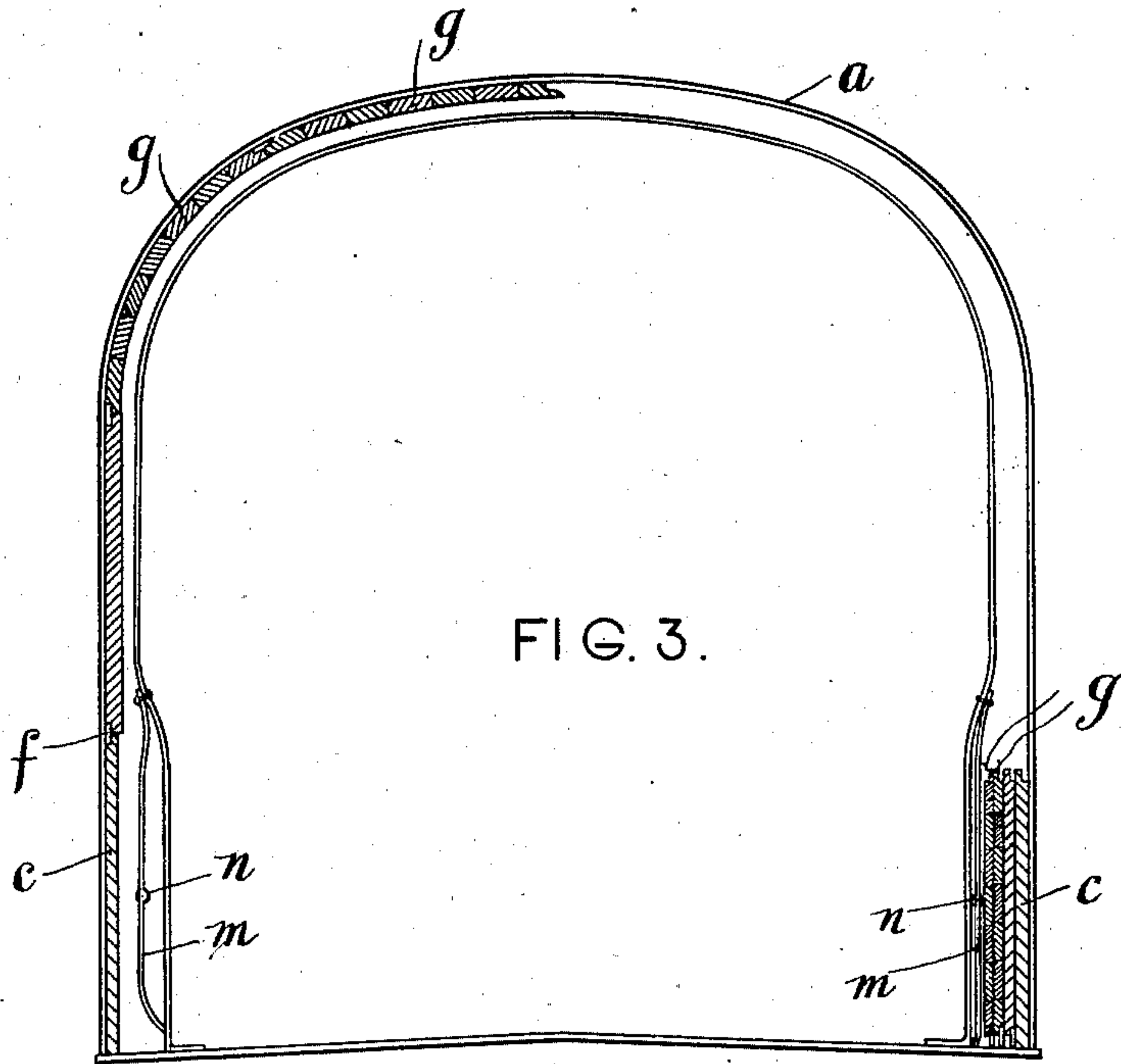
F. KENNINGTON.

ADJUSTABLE ROOF OR COVER FOR TRAM CARS.

(Application filed Jan. 21, 1902.)

(No Model.)

2 Sheets—Sheet 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

FREDERICK KENNINGTON, OF LEEDS, ENGLAND.

ADJUSTABLE ROOF OR COVER FOR TRAM-CARS.

SPECIFICATION forming part of Letters Patent No. 698,518, dated April 29, 1902.

Application filed January 21, 1902. Serial No. 90,607. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK KENNINGTON, a subject of the King of Great Britain and Ireland, and a resident of Leeds, in the county of York, England, have invented an Improvement in Adjustable Roofs or Covers for Tram-Cars, (for which I have made application for Letters Patent in Great Britain under No. 6,997, bearing date April 3, 1901,) of which the following is a specification.

This invention relates to an improved adjustable cover or roof for the outside seats of tramway-cars, and has for its object the construction of such a device so that it can be opened and closed at will with great facility and readiness, according to the state of the weather.

My invention consists, essentially, in the provision of movable shutters stowed when not in use in side boxes on the roof of the car and of arched standards carried over the outside seats and adapted to allow the said movable shutters to be slid up into and retained in position thereby.

In order that my invention may be the better understood, I will now describe the same in relation to the accompanying drawings hereunto annexed, reference being had to the letters marked thereon.

Like letters refer to like parts in the several figures.

Figure 1 is a vertical side elevation of the upper deck of an ordinary tram-car body with my invention applied to the roof thereof, one end being shown with the roof in position and the other end with it stowed away. Fig. 2 is a plan of the same. Fig. 3 is on the left-hand side a transverse section of the roof through the line *x y* in Fig. 1 and on the right-hand side is a view of the side and roof sections when stowed away in the side box. Fig. 4 is an end elevation showing the closing in of the ends. Fig. 5 shows the construction of the shutters in an enlarged detail view, illustrating the positions of the rollers in the channel of the standards by which the shutters are guided, two laths of the shutters only being shown by way of example. Fig. 6 is an end view of the laths and channel shown in Fig. 5.

To carry my invention into effect, I employ two or more suitably curved or arched stand-

ards *a*, of channel-section. These standards are either fixed rigidly at each side to the body of the car *b* or they may equivalently be supported in sockets or brackets carried by the car-body, so as to be detachable when required. To the lower part of the vertical portion of these standards I attach rigidly an outer board or panel *c*, which I preferably construct of a box formation, and within which I stow the sections of the cover or roof when not in use. Immediately above the fixed side *c* I arrange a panel *d*, having adjustable windows *e*, and this panel is of such a size and shape as to be contained when necessary in the box formation of the fixed side *c*. These windows *e* are made to slide between rabbets in the panel *d* in the usual known manner adapted for vehicle-windows, so that when the panel is placed in position on the side *c* the windows can when lowered pass down into the box formation of the side *c*. This window panel or section *d* is conveniently held in place by a bead or plate *f*, fixed along the outside lower edge of the panel *d*, so as to engage with the upper edge of fixed side *c*.

The upper and curved portion of the roof on each side consists of two flexible sliding shutters *g*, which are provided with rollers *h* at their extreme ends of every alternate lath *i* for guiding the shutters endwise and rollers *j* on each other alternate lath *i* to allow the shutter to run smoothly and easily over the flange of the channel-section arched standards *a*. The laths *i* are made in two pieces with a central sheet or core *k* of waterproof material, such as india-rubber cloth, the two parts of the lath being held together by means of screws *l* or other equivalent fastening devices. These shutters are arranged to slide within the flanges of the standards *a*, so as to be lowered into the box formation of the side *c*, and the flanges here are made to diverge to a greater width from each other, so as to take the window-panel *d* and the two flexible shutters *g* one behind the other in their stowed position, and in order to keep the panel *d* and shutters *g* in such position without rattling I provide a spring *m*, with a roller *n* on the side *c*, which holds them one against the other rigidly. When in their raised positions, the said shutters *g* are secured by a catch or fas-

tening *o* of any suitable construction, while the lower edges of the shutters lock over the upper edge of the next shutter or the panel *d*, as the case may be, by means of an overlapping bead, thus forming a completely weatherproof roof.

The ends of the roof or cover may be closed, if desired, by a sliding-door arrangement, as shown in Fig. 4, which is preferably constructed in three parts.

For convenience of adjustment and handling I prefer to make the roof in two sections longitudinally, two end standards and a double central standard being provided. When applied to electric trolley-cars, a space, such as is shown at *p* in Fig. 2, is left between the two sections for the trolley standard or arm to stand, the shutters *g* being made in each section to conform to this arrangement of standards.

In order to reduce the rattle and vibration of the shutters to a minimum, I prefer to make the rollers *h* and *j* of india-rubber or other equivalent resilient material.

When it is desired to cover over the car, one man can readily take each shutter, draw it up out of the retaining-box, and slide it up into its proper position.

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

1. An adjustable cover or roof for the outside seats of tramway-cars, consisting of two or more arched standards carried by the car-body, a series of waterproof shutters adapted to be guided at their ends in or on the said standards, and to be lowered into a stowed position one behind the other alongside a side board or panel forming the permanent side to the top deck of the car-body, means for mak-

ing a rain-proof joint at the junction of the shutters and fastening devices for securing the shutters to one another when in their elevated position, substantially as described.

2. In an adjustable cover or roof for the outside seats of tramway-cars, in combination, a permanent side or panel on each side of the upper deck of the car-body, two or more arched standards carried by the car-body extending transversely across same, a series of movable window-panels and a series of movable flexible waterproof shutters, adapted to be guided at their ends in or on the said standards so that they rest on each other in their extended form and can be lowered into a stowed position one behind the other alongside the said permanent side, means for making a rain-proof joint at the junction of the shutters and window-panels one with another, and fastening devices for securing the shutters to one another when in their elevated position, substantially as described.

3. In combination with a car-body, standards extending up from the body, a permanent side board at the lower part of the said standards, a box or pocket alongside the permanent side board, a removable panel having windows and adapted to fit on the permanent side board, and a flexible cover adapted to fit removably on the removable panel, the said removable cover and panel being adapted to be stored side by side on edge within the said box, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

FREDERICK KENNINGTON.

Witnesses:

PERCY FRANCIS CAMERON WILLCOX,
JOHN WALTER CAMPBELL.