

H. B. MYER.  
Safety-Cars.

No. 157,077.

Patented Nov. 24, 1874.

Fig. 1.

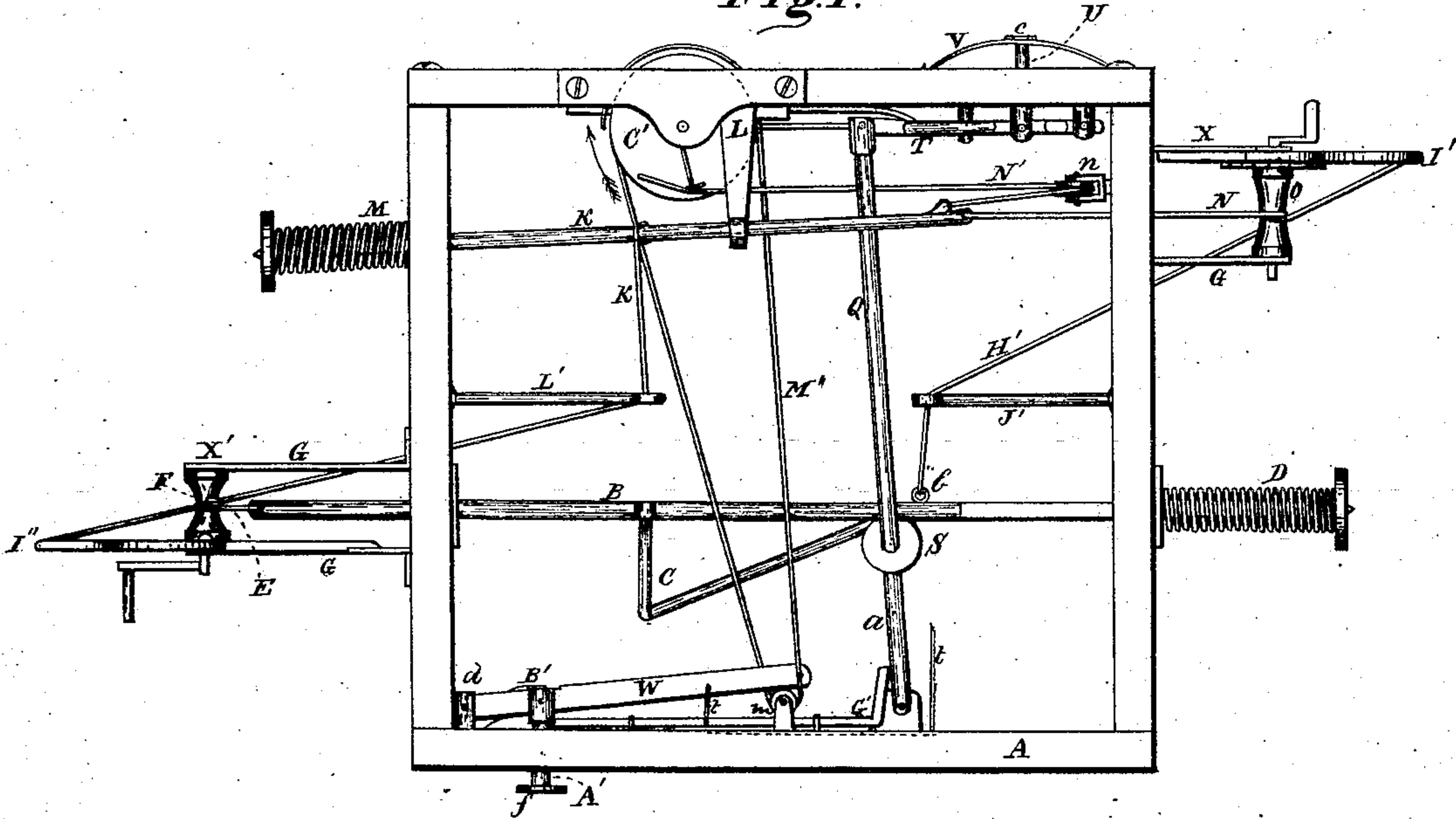
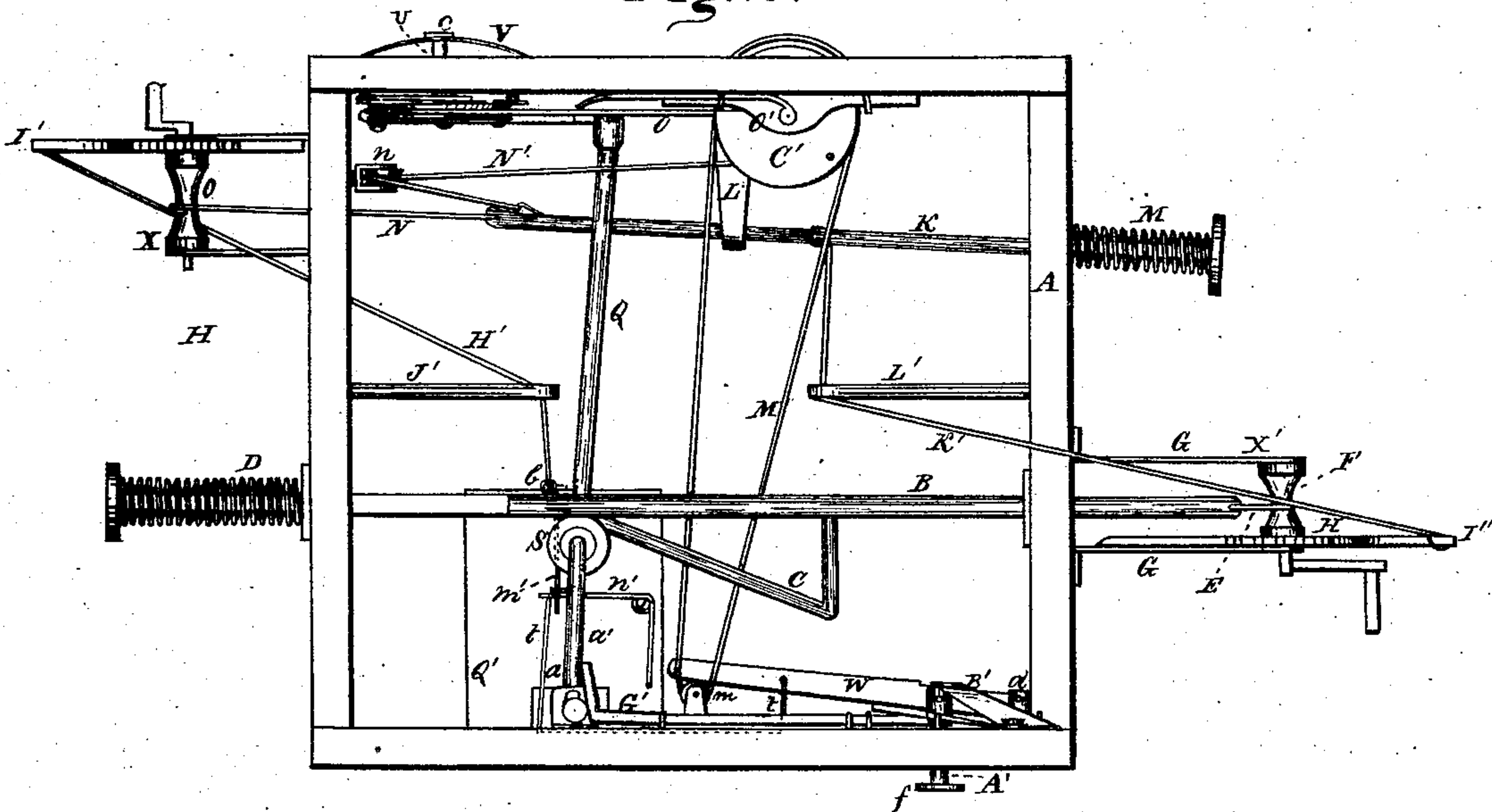


Fig. 2.



Witnesses.

A. F. Gornell.  
J. H. Vith

Inventor.

Henry B. Myer.  
Per. Burridge & Co.,  
attys.

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Fig. 3.

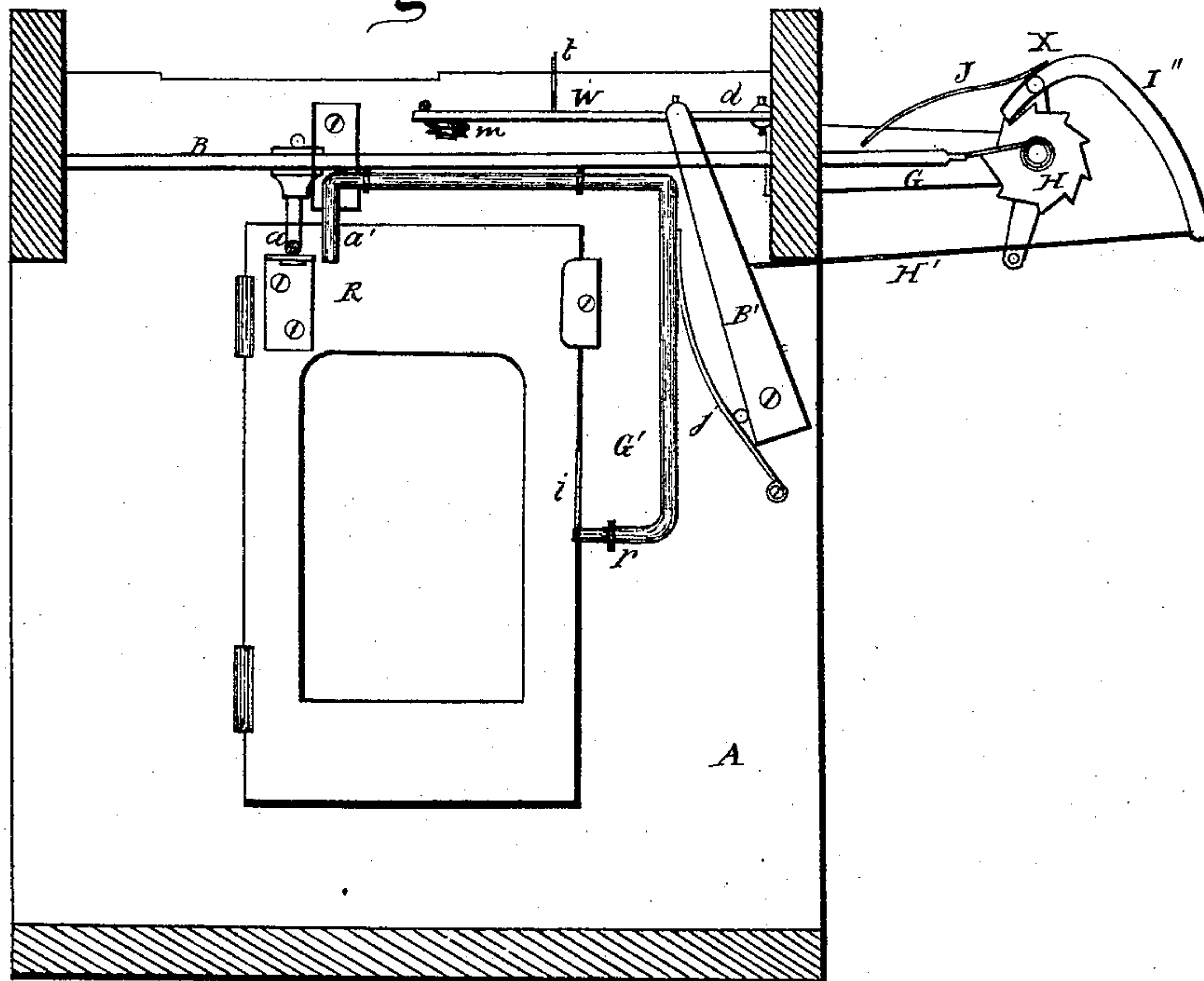
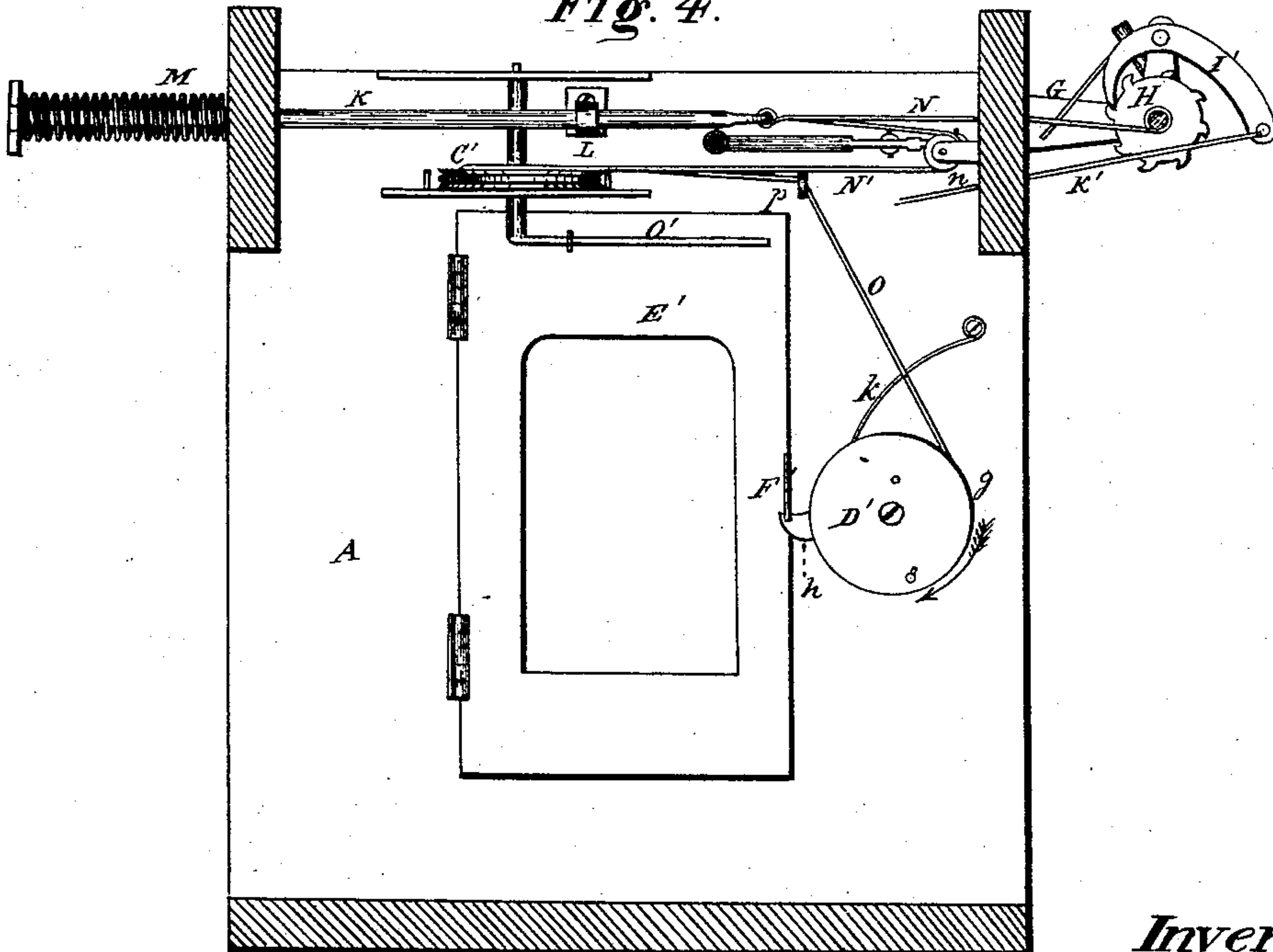


Fig. 4.



Inventor.

Henry B. Myer.  
Per. Burridge & Co.  
Attys.

Witnesses.

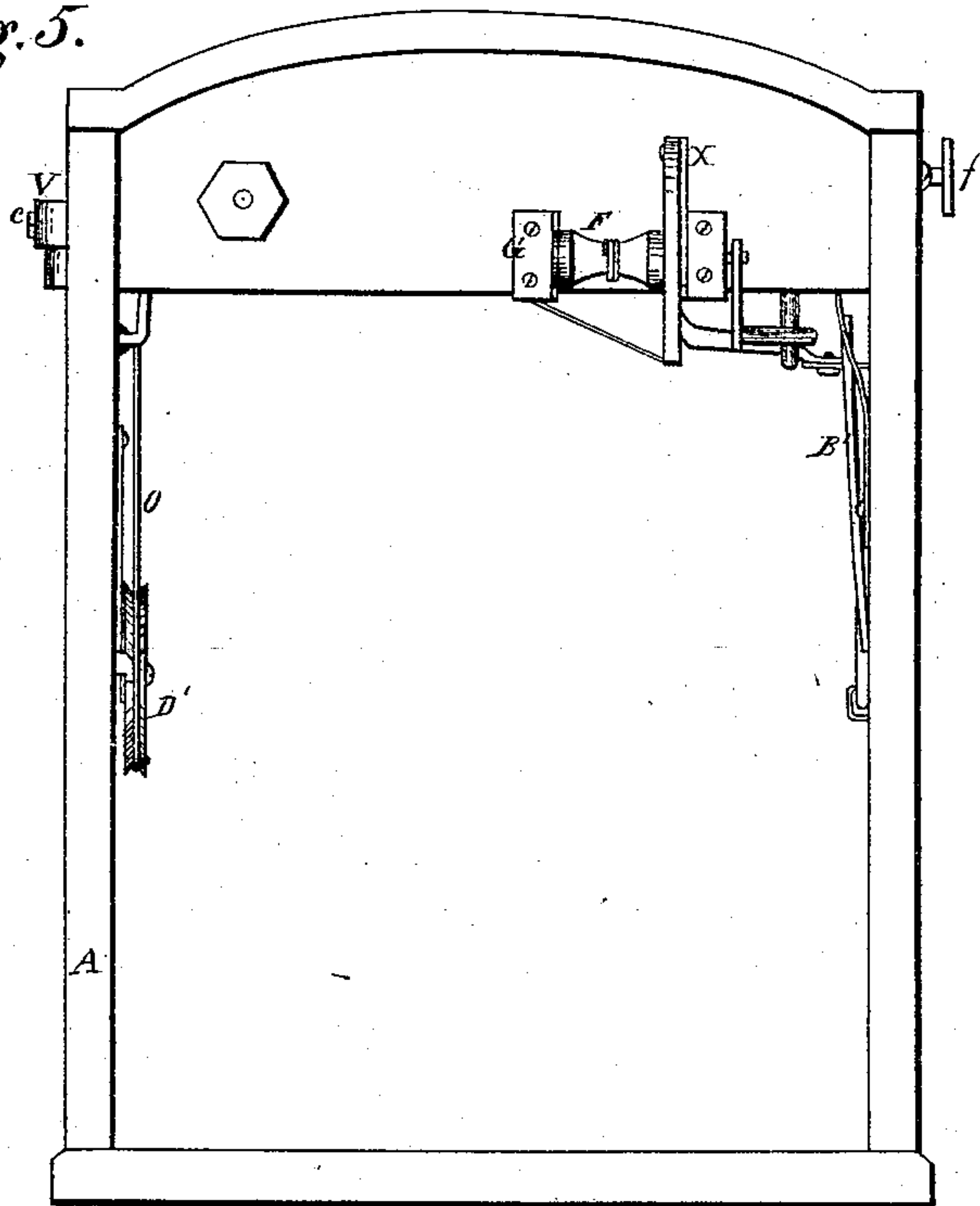
A. F. Cornell.  
J. H. Bath

H. B. MYER.  
Safety-Cars.

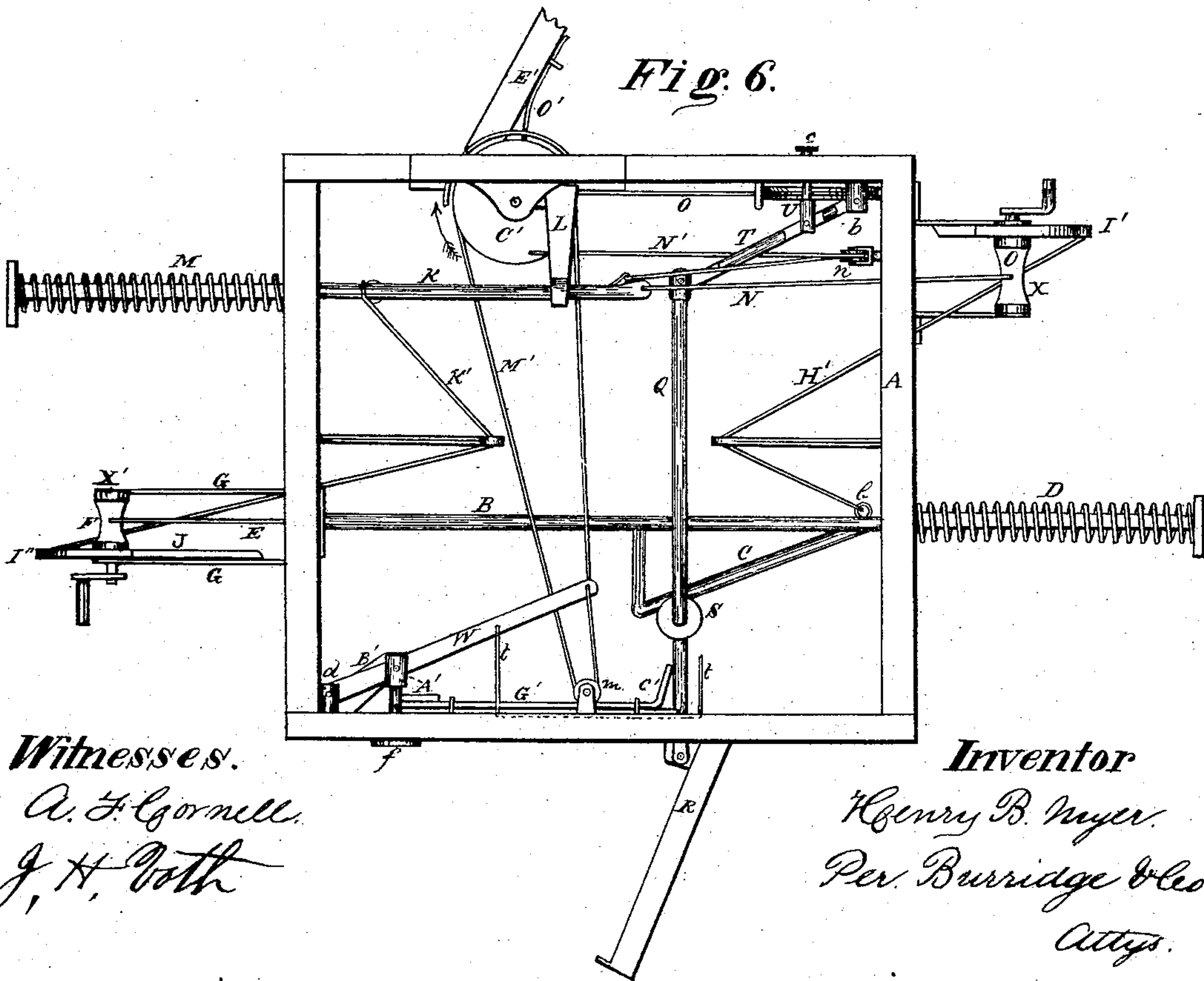
No. 157,077.

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*Fig. 5.*



*Fig. 6.*



Witnesses.

A. F. Cornell.  
J. H. Roth

Inventor

Henry B. Myer.  
Per. Burridge & Co.  
Atty.



# UNITED STATES PATENT OFFICE.

HENRY B. MYER, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN SAFETY-CARS.

Specification forming part of Letters Patent No. **157,077**, dated November 24, 1874; application filed August 8, 1874.

*To all whom it may concern:*

Be it known that I, HENRY B. MYER, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and Improved Safety Railway-Car, of which the following is a full and complete description, reference being had to the accompanying drawings making part of this specification, in which—

Figure 1 is a plan view of the devices for opening the car-doors. The roof of the car is represented as being removed, in order that said devices may be seen. Fig. 2 is an under-side view of Fig. 1, having the roof thereon. Fig. 3 is an inside view of one side of the car. Fig. 4 is a view of the opposite side of Fig. 3. Fig. 5 is an end view of the inside of a car. Fig. 6 is a plan view of the inside of the car, showing the devices referred to in a different position than shown in Figs. 1 and 2.

The roof of the car is removed in order that the several devices may be seen.

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

The nature of this invention relates to certain devices or mechanism arranged in a railway-car, so that, in the event of a collision, fire, or oversetting of the car, egress can be had therefrom through the doors or windows on the sides, and through doors in the top and ends of the car, which are automatically opened by the aforesaid mechanism, substantially in the manner as hereinafter described, the same being an improvement of a similar invention, for which a patent was granted to me March 10, 1874.

In view of the many railway accidents involving the loss of life from the inability of passengers to escape from the debris of a car crushed or overturned in a collision or other accident of a similar character, I propose by this invention to increase the facilities of escape from the cars, and thereby save life by constructing said cars with large hinged window-frames on the sides attached to the above-described mechanism, and thereby cause them to fly open in the event of a collision or other similar accident, and thus afford means of egress from the cars for the passengers.

The construction and operation of the aforesaid mechanism are, in detail, as follows:

In the drawing, A represents the frame or body of the car, the general construction whereof does not differ from those in ordinary use. Close to the ceiling of the car is arranged the mechanism referred to, consisting of a rod, B, Figs. 1 and 2. Said rod passes through the entire length of the car near the ceiling. From one side of the rod projects a triangular-shaped cam or inclined plane, C. On one end of the rod outside the car is coiled a spring, D. To the opposite end of the rod is attached a cord, E. Said cord is made fast to, and wound around, the drum F of a windlass, X', secured to the end of the car in brackets G, Fig. 3, of said windlass. H is the ratchet wheel; I', the pawl or dog, and J the spring, whereby the pawl is made to engage the wheel. K, Figs. 1 and 2, is a rod projected through the end of the car, and whereby it is supported. The inner end of the rod is supported by an arm, L, through which, and through the end of the car, it slides, for a purpose presently shown. On the outer end of the rod referred to is coiled a spring, M, similar to the spring D on the rod B. To the inner end of the rod K is attached one end of a cord, N. The other end of the cord is attached to and wound around the drum or barrel O of a windlass. Said windlass is a duplicate of the one above described, and used for a similar purpose. Q, Figs. 1 and 2, is a bar. One end thereof is hinged to a swing door or window, R, Fig. 3, at *a* in the side of the car. Said bar extends across the car, and is made to pass above the rod B by turning the bar upward, and then downward again, as shown in Fig. 1. On the short vertical part of the bar, whereby its angular deflection is made, is a grooved roller, S, in which is received the side of the triangular cam C. The opposite end of the bar is pivoted to one end of a lever, T, Figs. 1 and 6. Said lever is pivoted at *b* to the side of the car. U is a rod pivoted to the lever, and made to pass through the side of the car, and a spring, V, to which spring it is fastened by a nut, *c*, as shown in Fig. 1. On the opposite side of the car is pivoted a lever, W, at *d*, to which is also pivoted a rod, A', and made to pass through the side of the car. On the protruding end of the rod is a button, *f*, whereby



it is prevented from being drawn through into the car. B', Fig. 3, is a spring, whereby the lever is held in the position shown in Fig. 1. To the side of the car is journaled a grooved wheel, C', Figs. 2 and 4. A similar wheel, D', is secured to the side of the car at *g*, from the perimeter of which projects a lug, *h*, Fig. 4, whereby the door E' is held closed by locking in the catch F' of the door. The door R, above referred to, is held closed by a slide, G', Fig. 3, the lower end whereof slides into the catch *i* of the door, as shown in said Fig. 3, by being pushed therein by the spring *j*. In like manner the lug *h* of the wheel D' is made to engage the catch F' by a spring, *k*, Fig. 4.

The several bars, rods, levers, &c., above described, are connected to each other for co-operation by cords in the manner as following:

To the rod B, at *b*, Fig. 1, is attached one end of a cord, H'. Said cord passes through the end of an arm, J', to the end of the pawl or dog I' of the windlass X, Fig. 3. To the rod K is attached a cord, K', wherefrom it proceeds, through the end of the arm L', to the end of the pawl or dog I'' of the windlass X'. To the end of the lever W, Fig. 2, is secured one end of a cord, M'. Said cord runs therefrom to and around the grooved wheel C'; hence back to and around the sheave *m*, to the end of the lever from whence it started, and to which it is made fast again; also, from the end of the rod K proceeds a cord, N', Figs. 1 and 2, around the sheave *n*, to the wheel C', in the side of which it is fastened. To the wheel C' is also attached a cord, *o*, Fig. 4, which proceeds therefrom, through the eye *p*, to the wheel D', to which it is made fast.

The connections and arrangements of the several cords will be fully seen and understood on examination of Figs. 1, 4, and 6.

The doors R and E' above referred to consist of large frame-works hinged to the sides of the car, forming doors, in which are set the ordinary glass windows and screens.

The purpose of the mechanism above described is to open said doors automatically and instantly in the event of accident by collision or otherwise, so that the passengers can find ready means of escape from the car, and thereby save life, which might otherwise be lost from the want of such egress from the cars.

Of the practical operation of the devices the following is a description: The relative position of the several devices in respect to each other, as shown in Figs. 1 and 2, is such as when set for holding the doors closed under ordinary circumstances. In this condition of the mechanism the slide G' of the door R and the lug *h* of the door E' are pushed into their respective catches *i* and F', thereby holding them closed. The relation of the several parts to each other, as shown in Fig. 6, is such as when the doors are sprung open, in the event of accident, for the escape of the passengers from the cars.

In order to close the doors and place the

mechanism in position for again opening them as shown in Fig. 1, the windlass X is operated, thereby winding up the cord N, which will draw the rod K from its position shown in Fig. 6 to that shown in Fig. 1, in which it will be seen that the spring M is compressed, but which cannot draw back the rod, for the reason that the pawl of the windlass prevents it. As the rod is drawn forward the cord N' is slackened, which permits the wheel C' to turn in the direction of the arrow in Fig. 1. Said wheel is turned by the cord M', which, being attached to the lever W, the lever, on being forced back by the spring B', turns the wheel by drawing on the cord, no resistance being offered by the stronger spring M. This turning of the wheel shuts the door E by means of the arm O', Figs. 4 and 6, projecting from the lower end of the spindle of the wheel, and attached to the door, as shown in Fig. 4. By the time that the door is closed the cord O, Fig. 4, attached to the wheels C' and D, is so much slackened as to allow the spring K to turn the wheel D' in direction of the arrow, thereby causing the lug *h* to engage the catch F', as shown in Fig. 4, thus holding the door fast.

The door R on the opposite side of the car is closed as follows: On turning the windlass X' the rod B is drawn forward by winding up the cord E. This drawing forward of the rod B compresses the spring D, but which cannot draw back the rod, for the reason that the pawl of the windlass holds it. This forward movement of the rod B from the position shown in Fig. 6 to that shown in Fig. 1 allows the bar Q to move forward at the same time as fast as the cam C moves away from the roller S by the reaction of the spring V, Fig. 1, to which the lever T is attached by the rod or stem U, and to which lever the bar is connected, as aforesaid. As the bar Q is attached to the door R, it will be obvious that, as the bar is drawn upon by the lever and spring, the door will also be drawn upon and closed, and which will be held shut by the slide G', Fig. 3, which is forced forward at the moment the door is shut by the spring *j*, which pushes the lower end *r* of the slide into the catch *i*, as shown in Fig. 3, thereby holding the door closed, as shown in said figure.

The doors, when thus closed and fastened, and the relative position of the several parts of the mechanism for closing them at this time, are such as shown in Fig. 1, and which are thus retained so long as the pawls of the windlasses remain engaged therewith. Hence it will be obvious that, as soon as the pawls are disengaged from the ratchet-wheels of the windlasses, the reaction of the springs M and D will change the relation of the mechanism from that shown in Fig. 1 to that shown in Fig. 6, in which the doors are shown to be open. This disengagement of the pawls with the windlasses will take place on striking upon their outer edge, and which may be by a collision or other accident. The instant the



pawls are thus disengaged the spring M will draw back the rod K, which will pull upon the cord N', thereby turning the wheel C' in the opposite direction from that indicated by the arrow by the superior strength of the spring M overcoming that of the spring B'. This reverse movement of the wheel at the same time draws upon the cord O, thereby causing the wheel D' to turn in the opposite direction from that indicated by the arrow in Fig. 4, which will remove the lug *h* from the catch F', and allow the door E' to fly open by the reaction of the spring B' on the lever W, to which the cord M' is connected. The wheel C', being turned thereby, pushes suddenly open the door by means of the arm O', where-by it was closed, as above described.

The door R is opened by the disengagement of the pawl of the windlass X'. The reaction of the spring D draws back the rod B from the position shown in said figure by the cam or inclined plane C, over which the roller runs, thereby crowding the bar and the door R, to which it is connected, suddenly out, as shown in said Fig. 6. At the moment the bar begins to push open the door the slide G' is released from the catch *i* by the bar pushing upon the end *a'*, Fig. 6, of the slide, thereby overcoming the resistance of the spring *j*, and thus unfastening the door in time for it to swing open by the action of the bar upon it.

It is desirable that the doors on each side of the car be opened simultaneously in the event that one windlass only should be affected, which, in a case of collision, might be the fact. Hence, to cause all the doors to open at once, the pawl of the windlass X is connected, by a cord, H', to the rod B of windlass X', and the pawl of the windlass X' is connected by the cord K' to the rod K of windlass X.

It will be obvious that, by this connection of the pawls and rods, the operation of one pawl and its connections must operate the pawl and its connections on the other at the same time, thereby causing a simultaneous operation of both windlasses for the purpose specified.

In the drawings a section of a railway-car only is represented, showing a door on each side, with the appropriate mechanism for operating them for the purpose of illustration. The mechanism, however, can be extended by duplications in part thereof, so as to be applied to all the windows or doors in each side of the car, all of which are operated substantially in the same manner.

Further means of egress from the car may be had by having swing-doors in the ends and roof of the car. Such roof-door is represented

at Q', Fig. 2. Said door is hinged to the roof of the car, and whereof it forms a part. The door is fastened by a sliding bolt, *m'*, secured to the door by staples, through which it slides beyond the edge of the door into the roof of the car. *n'* is a spring, one end of which enters an eye in the end of the bolt, whereas the other end is fastened to the door. On attaching a cord, *t*, to the eye of the bolt, and to the lever or arm W, said lever, on being operated as and for the purpose above described, will draw back the bolt conjointly with the opening of the doors R and E', and allow the door Q' to fly open by means of a spring arranged in connection therewith for that purpose, and thus afford additional avenues of escape from the car to the persons therein.

It will be obvious that doors in the end of the car may be operated by substantially the same means employed in opening the doors or windows at the sides of the car, as above described.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The slide-rod B, cam or inclined plane C, spring D, windlass X', and pawl and ratchet, combined substantially as and for the purpose set forth.

2. The slide-rod B, cam C, spring D, and windlass X', in combination with the bar Q, roller S, lever or arm T, stem U, and spring V, substantially as and for the purpose specified.

3. The combination of the slide G', spring *j*, bar Q, and catch *i*, as and for the purpose set forth.

4. The slide-rod K, spring M, windlass X, and cord N', in combination with the arm or lever W, spring B', wheel C', cord M', arm O', and door E', substantially as and for the purpose specified.

5. The wheel D', lug *h*, spring K, and cord O, in combination with the wheel C' and catch *f*, substantially as and for the purpose set forth.

6. The slide-rod B, cord H', and windlass X, combined as and for the purpose specified.

7. The combination of the slide-rod K, cord K', and windlass X', as and for the purpose set forth.

8. The combination of the bolt *m'*, spring *n'*, cord *t*, and arm or lever W, as and for the purpose set forth.

9. The combination of the lever or arm W, spring B', and cord *t*, substantially as and for the purpose specified.

HENRY B. MYER.

Witnesses:

J. H. BURRIDGE,  
A. F. CORNELL.