(No Model.) 2 Sheets—Sheet 1.

S. WORKMAN.

SAFETY EXPRESS CAR.

No. 385,396. Patented July 3, 1888.

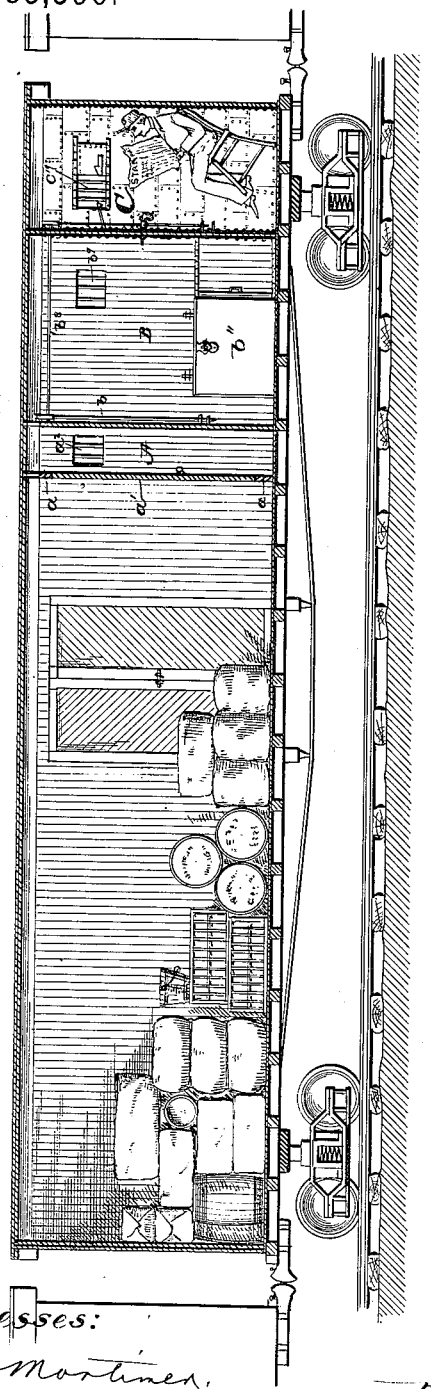

Fig. 1.

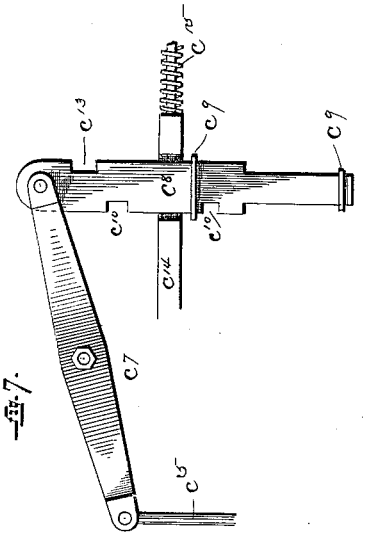

Fig. 7.

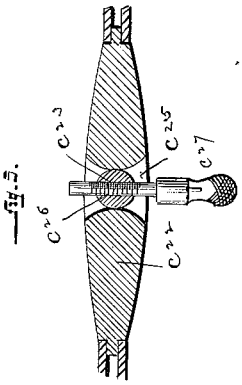

Fig. 3.

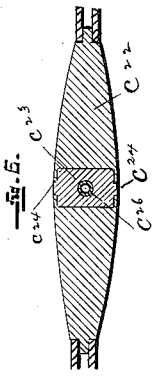

Fig. 6.

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his Attorney

(No Model.) 2 Sheets—Sheet 2.

S. WORKMAN.

SAFETY EXPRESS CAR.

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Fig. 2.

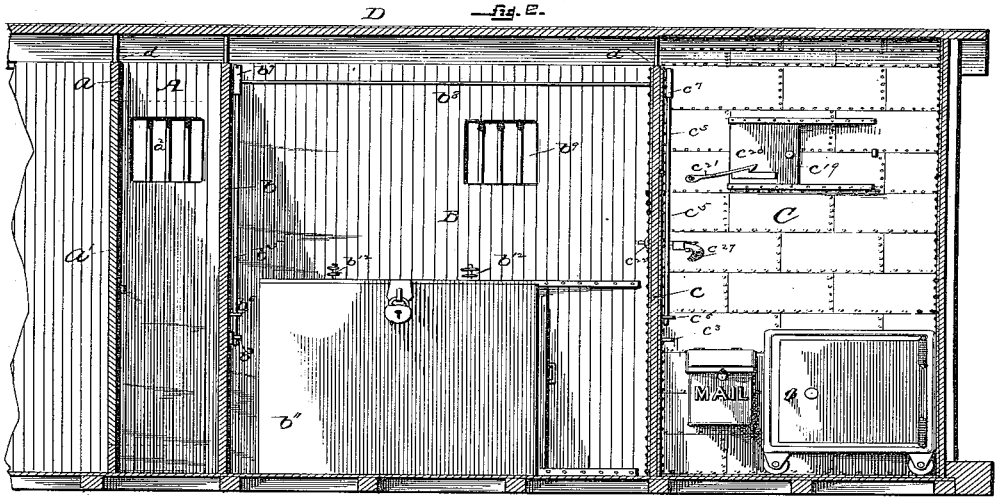


Fig. 4.

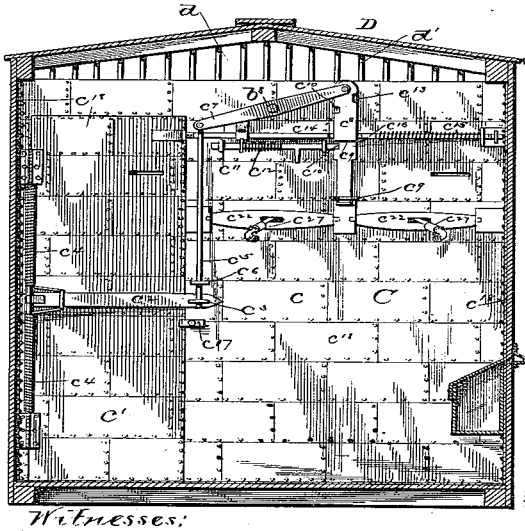
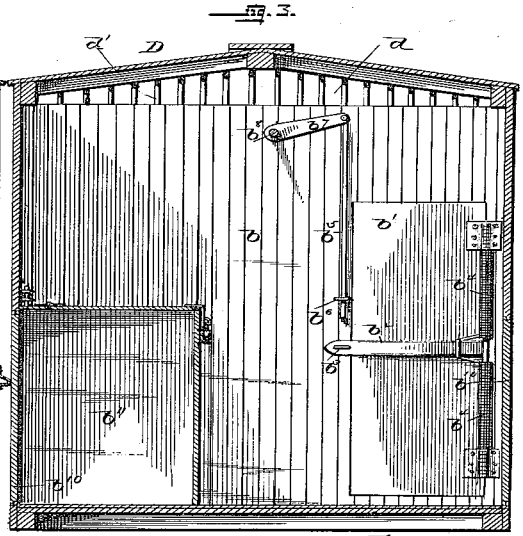


Fig. 3.



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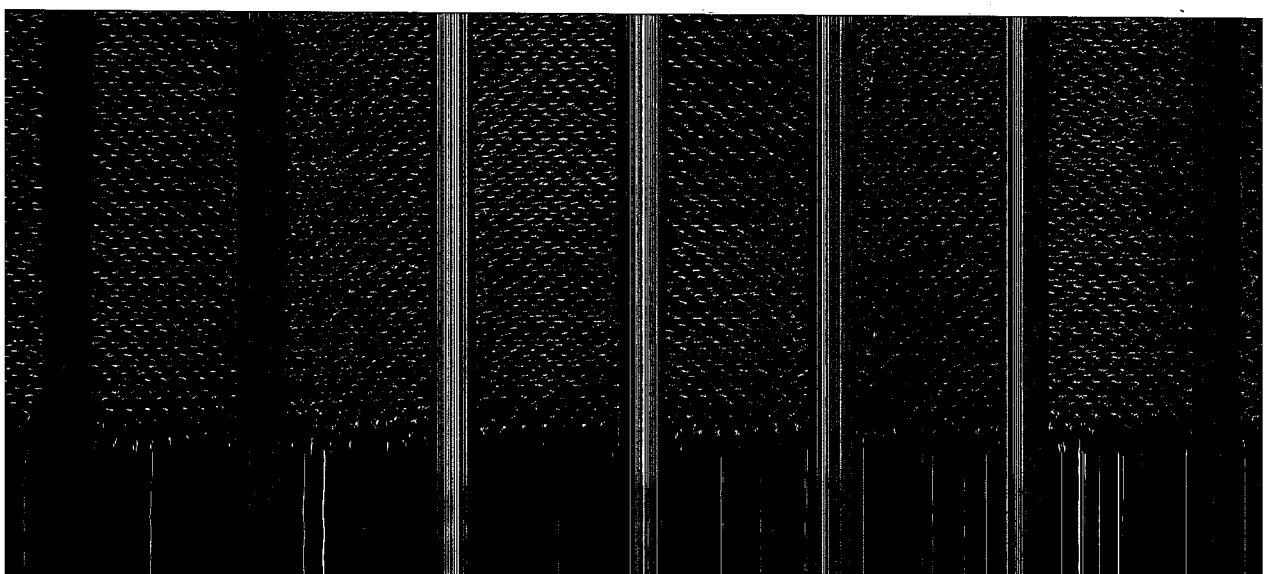

UNITED STATES PATENT OFFICE.

SAMUEL WORKMAN, OF BEATRICE, NEBRASKA.

SAFETY EXPRESS-CAR.

SPECIFICATION forming part of Letters Patent No. 385,396, dated July 3, 1888.

Application filed October 16, 1886. Serial No. 216,446. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL WORKMAN, a citizen of the United States, residing at Beatrice, in the county of Gage and State of Nebraska, have invented certain new and useful Improvements in Safety Express-Cars; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to express-cars.

It is a well-known fact that express-cars in which articles of great value are frequently transported are peculiarly liable to attack from train-robbers and other thieves, and should therefore be so constructed and guarded as to be in whole or in part practically safe, into which it is impossible for any person to force an entrance; furthermore, in express-cars as now constructed the robber, after obtaining admittance, by fraud or otherwise, through an outer door, has merely to overpower the person in charge, when the entire contents of the car are at his mercy, the interior of the car being practically one large room protected only by a single strongly-barred door.

The object of my invention is to prevent the entrance of any person into a car or part of a car to be guarded without the consent of the person in charge; furthermore, to enable a person in an inner or third compartment to admit any one from an outer or first into a middle or second compartment without leaving the inner compartment; furthermore, to enable the person in the inner or third compartment to satisfy himself, by inspection, as to the identity of the person whom he has admitted into the second compartment, and, finally, to enable the inner compartment effectively to be defended against any suspicious persons who might by deception have obtained access to the middle compartment.

With these objects in view, my invention consists, essentially, in a car, the whole, or preferably a portion, of which is divided by transverse vertical partitions into three compartments or chambers, a narrow outer end compartment, No. 1, a middle receiving-compartment, No. 2, having a caged receiving-door, and, finally, an inner compartment, No. 3, forming a safe or magazine, which is entered through a bullet-proof partition, and in which the person in charge of the car is stationed, and which must be entered from the second or middle compartment, the doors leading into the second or middle and the third or inner compartments being provided with locking devices, which must be operated from the inner compartment, the locking devices being so arranged that, of the two doors through which it is necessary to pass in order to enter the third compartment, one will be locked by the same movement which unlocks the other, it being impossible to unlock the door leading into the second compartment until the door leading into the third compartment is closed and in position to be secured by the same movement which unlocks the door leading into the second compartment; and, finally, the invention resides in means of defense and various novel details of construction shown, whereby the objects of the invention are attained.

In the accompanying drawings, in which like letters of reference indicate corresponding parts, Figure 1 is a longitudinal vertical sectional view of a car in which my invention is embodied, showing one side of my safety portion with windows, sliding door, and cage or box, and the construction and arrangement of the transverse vertical partitions with entrance-door in the first. Fig. 2 is a view similar to that shown in Fig. 1, but displaying, on an enlarged scale, the safety portion of the car, and showing in addition mail-box and safe in the inner compartment. Fig. 3 is a transverse vertical sectional view taken through the second or middle compartment, showing the door between the first and second compartments and the means for locking it, and showing in longitudinal section the box or cage into which packages, &c., may be put at the various stations and from which packages may there be removed, the view being such as to show the sliding door and cage on the opposite side of the car to that seen in Figs. 1 and 2. Fig. 4 is a transverse vertical sectional view taken through the third or inner compartment, showing the devices for locking the third door or door to the inner compartment, and for operating from the inner compartment the fastenings of the second door, showing the devices which compel the closing of the third door or door to the inner compartment before the sec-

ond door can be unlocked, showing the sight-openings to enable the person in the third compartment to inspect any one admitted in the second compartment, showing the devices for defending the third or inner compartment from assault, and showing the mail-box. Fig. 5 is a horizontal sectional view showing in detail the means for effectually defending the third or inner compartment, with the blocks for mounting and permitting the requisite training of the fire-arms. Fig 6 is a central vertical longitudinal section of a portion of Fig. 5, showing the inner block and its bearings in the outer block; and Fig. 7 is a detail view of the part of the locking device which is in the inner chamber.

It is preferred that the space which the burglar-proof or safety express-car is to occupy in an ordinary express-car shall be about one-third of the length of the car in which it is located, the length, however, to vary as may be desirable according to the length of the various express-cars or as may be desired by the different companies—say, from twelve to fourteen feet.

The safety portion is to be divided into three compartments. The outer end of the safety portion—that is, the end which is toward the center of the car—will have in the partition separating the entire compartment from the rest of the car and at one side a door of usual size and strength, by which door the first compartment is entered. A short distance from this outer partition—say eighteen inches therefrom—in a direction away from the center of the car and toward its end, there will be another partition, in which, on the opposite side of the car from the first door, there will be a second door opening into a second compartment of about four times the length of the first compartment, and in a partition at the farther end of this compartment, and on the side of the car opposite to that at which the second door is located, is a third door opening into the third compartment, which is about two-thirds the length of the second compartment. The first compartment is called the "outer chamber," the second compartment the "middle chamber," and the third compartment the "inner chamber," "safe," or "magazine." Each side of the entire safety portion is to have three windows, one at the side of each compartment; but there is to be no door at the side of any one of the compartments by which ingress or egress of a person could be effected.

As above indicated, the outer chamber is to be about eighteen inches in length from partition to partition, and the windows at its sides, for light and ventilation, will be ordinary openings securely barred. The purpose of having the outer chamber so small is to prevent a burglar or other person bent upon violence from being able successfully to wield an axe, a sledge-hammer, or other heavy implement against the door in the partition between the outer and middle chambers.

The middle chamber is to be about six feet in length, and the windows at its sides, for light and ventilation, will also be ordinary openings securely barred; but in addition to the windows there will be at each side a sliding door covered within the chamber by a box or cage from four to five feet long and about three and one-half feet high, the slide serving to permit or exclude admission to the box or cage from outside, as when packages are to be received or delivered at a station, or when such are to be taken from or put into the box or cage by the person who has charge of the car. The sliding door is of course capable of being securely fastened from within, and the box or cage will be securely fastened over the sliding door.

The box or cage may be provided with a suitable lid, and when this is closed and locked down communication between the interior of the car and the outside through the sliding door is completely cut off; but should conversation between agents be desirable, the window at the side of the car, over the box or cage, can be approached, and communication can be had through this. If necessary, the windows at the sides of the middle chamber can be so arranged as to be capable of being opened sufficiently long to permit the signing of receipts. It will be seen that the middle chamber is intended as a receptacle for goods, chattels, merchandise, and other valuables to be conveyed upon the train, and which are placed in charge of the express company at the various stations along the road for transportation.

As above indicated, the inner chamber is to be about four feet in length; but the windows at the sides, in addition to being openings strongly barred, are to have sliding metallic shutters upon the inside, which are always to be kept closed and locked shut when the car is not in motion, and aside from ventilating means there is to be no further opening in this chamber, except the door which leads to it from the middle chamber. The inner chamber is to constitute, practically, a safe, and is preferably made of two-inch oak, matched and ceiled outside, as usual, and lined, if desired, with strong metallic plates securely fastened. This inner chamber is intended to contain the safe, letter-boxes, cartridges, and the water-closet, and is to be arranged and guarded as follows:

The partition between the middle and inner chambers is to be of metal, or to be lined or sheathed on both sides with metallic—say steel or iron—plates, to render it bullet-proof. The door in this partition is to be equally well protected, and will be so provided that it can never be unlocked while the door between the outer and middle chambers is open or unlocked. The door between the middle and inner chambers will turn upon hinges and open against a spring tending forcibly to close it. One way of accomplishing this is to connect the hinges by a rod, upon which is a double spiral spring having its ends bearing against the door or against a bar extending across the door, this

bar at its outer end to form a hasp, and at its inner end to be rounded and perforated to permit the passage of the rod upon which the spring is supported, and thus give firmness and strength thereto.

The door in the partition between the middle and inner chambers will be locked as follows: The bar at the outer end where it forms the hasp is entered by a staple in the partition, and above in this partition is a similar staple to act as a guide to a bolt passing down through these two staples and over the bar of the door to lock it. This bolt is pivoted to one end of a pivoted lever hung at the center of the partition between the middle and inner chambers, which lever has fixed to it or in it between its ends a rod, which extends through the partition between the middle and inner chambers and across the middle chamber to a lever-arm pivoted in the middle chamber upon the partition between the outer and middle chambers, and the door between the outer and middle chambers is locked from this arm in a similar manner and by the same appliances as described for locking the door between the middle and inner chambers.

The pivoted lever hung at the center of the partition between the middle and inner chambers is attached to the end farthest from the door in this partition to a flat perpendicular bar with a handle below, by means of which the agent within the inner compartment can lock and unlock the doors between the outer and middle and the middle and inner chambers. This flat bar has two square recesses on one side and one square recess on the other. Of the two recesses on the one side the upper one, when the bar is pulled down by the agent, presents entrance for a retaining bar or stop, which is forced by a spring, while the lower one presents another for the retaining bar or stop when the flat bar is pushed up. The pulling down of the flat bar locks the door between the outer and middle chambers and unlocks the door between the middle and inner chambers, and the retaining bar or stop in the upper recess holds the door between the outer and middle chambers locked. This stop must be pushed upon its spring and out of the upper recess to allow the door between the outer and middle chambers to be unlocked by the pushing up of the flat bar aforesaid and to lock the door between the middle and inner chambers. When the flat bar is pushed up, the spring-stop enters the lower recess and holds the door between the middle and inner chambers locked.

The square recess on the other side of the flat bar is made for the admission of a long square retaining bar or stop on the partition between the middle and inner chambers, which, by the opening of the door between the middle and inner chambers and by a spring, is made to take into this recess and hold the flat bar to prevent its being pushed up to open the other door. One end of this spring-stop is similar in shape to the latch of an ordinary door-lock, and it is arranged with the sloping side out from the partition. The closing of the door between the middle and inner chambers pushes this stop back, thus allowing the agent to push up the flat bar after pressing aside the spring-stop from the upper of the two recesses on the one side of the flat bar and lock the door between the middle and inner chambers and unlock the door between the outer and middle chambers. While the door between the middle and outer chambers is unlocked, the door between the middle and inner chambers is locked, and vice versa. Should the agent become careless and hold the door between the middle and inner chambers open by placing something against it, he cannot accidentally open the door between the outer and middle chambers.

The partition between the middle and inner chambers has extending throughout from the inner chamber two or more self-cocking breech-loading revolvers, or other suitable arms, swung upon a double pivot and showing nothing but their muzzles to an occupant of the middle chamber. These fire-arms are so arranged as to command in range the door between the outer and middle chambers and nearly all of the middle chamber.

It is expected that the agent who is to succeed the one on duty will have a key to the outer door, or door No. 1, and will apply at the door to the middle chamber, or door No. 2, which has no key-hole or lock upon the outside in the outer chamber, or chamber No. 1, for admittance, either by some well-understood signal, as by a peculiar knock, a push-button, bell-signal, or otherwise. When the proper signal has been given, the agent within will push up the flat bar, thereby unlocking door No. 2 and locking door No. 3, or that between the middle and inner chambers. The applicant will then be seen by the agent in the inner chamber, or chamber No. 3, through a small eye or peep-hole, of which there may be one, two, or more cut at proper places through the partition between the middle and inner chambers, and perhaps, also, in door No. 3, and convenient for the agent while holding the fire-arm or fire-arms. Should the incoming person be the proper relief agent, the agent within chamber No. 3 pulls down the flat bar, thereby unlocking door No. 3 and locking door No. 2, and the second agent is admitted, and, assuming his place in chamber No. 3, locks door No. 3, unlocks door No. 2, and permits the first agent, who is now relieved, to pass out of door No. 2, and locks it after him.

Should an unauthorized person gain admittance to the middle chamber by having in some way become possessed of knowledge of the requisite signal, and the agent on duty, by failing to recognize him, become suspicious, the said agent will reach to the door of the inner chamber, where he is, turn a button or push a bolt, and lock it, while door No. 2 is locked, and thus hold the suspected person in chamber No. 2. The agent can, by firing a

pistol through a window of the inner chamber, bring the train to a stand-still and receive aid in arresting the intruder, or can, if must be, shoot him.

The roof is to be secure and strong, and bars or a strong wire screen from the wall-plates to it will allow air to circulate from compartment to compartment.

The window-shutters in chamber No. 3 are to be fastened by a spring-catch.

Referring to the drawings, the first compartment or outer chamber is represented by the letter A. This compartment has a partition, *a*, which separates it, and, indeed, the entire safety express-car from the rest of the car, or from the outside, and is provided with a door, *a'*, which is to be locked with an ordinary key, is swung automatically into closed position by a suitable spring, and presents the means of entering said first compartment from without. The compartment has securely-barred windows at the sides, marked a^2. The next compartment—that is, the second compartment or middle chamber—is marked B. This compartment has preferably about eighteen inches from the first partition, or that marked *a*, a partition, *b*, which separates it from the outer chamber, A, and is provided with a hinged door, *b'*, at the farther side of the car from the door *a'*, and across the center of which is secured a flat bar, b^2, having a slot in its free end, through which, when the door is closed, passes a staple, b^3, the door being automatically closed and held in its closed position by springs b^4 and locked in its closed position by a vertically-sliding bolt, b^5, the free end of which passes through a guide-staple, b^6, above the staple b^3, and then, when pushed down, through the staple b^3. The upper end of this bolt is pivoted to the free end of an arm, b^7, fixed to one end of a rock-shaft, b^8, and against the partition, the rock-shaft extending lengthwise through the middle chamber at the upper part. When the arm is swung downward by turning the rock-shaft, the bolt b^5 will be pushed down and the door locked, while, when it is swung upward by turning the rock-shaft in the opposite direction, the bolt will be raised and the door unlocked. Securely-barred windows at the sides of this compartment are marked b^9. The sliding doors at the sides are marked b^{10}, and are securely bolted on the inside when closed, and over either sliding door is a movable box or cage, b^{11}, open at the side against the sliding door, provided, if desirable, with a securable lid, and of size and form to adapt it to cover the sliding door opening into it, the said box or cage being fastened in position to prevent displacement by force from outside when the sliding door is open for the reception of packages by suitable means—such as reciprocating bolts b^{12}—in the frame of the sliding door and entering the top of the cage. Before the train halts at a station the express-messenger places in the box the articles which are to be delivered at that particular station, and firmly secures the box at the door on the proper side of the chamber with its mouth covering the sliding door. When the train stops, the messenger slides back the door at that side of the car and the station agent can remove the articles contained in the box and put into it the things at that station to be taken into the express-car. The barred windows may be swung open long enough to permit the signing of receipts. As soon as the transfer is completed the sliding door will be closed and bolted, and the contents of the box will be removed, as by a securable lid or by moving the box, and placed in their proper places.

The last compartment—that is, the third compartment or inner chamber—is maked C. This compartment has preferably about six feet from the second partition, or that marked *b*, a partition *c*, which separates it from the middle chamber, B, and is provided with a hinged door, *c'*, across the center of which is secured a flat bar, c^2, having a slot in its free end, through which, when the door is closed, passes a staple, c^3, the door being automatically closed by springs c^4, and locked in its closed position by a vertically-sliding bolt, c^5, the free end of which passes through a guide-staple, c^6, and then, when pushed down, through the staple c^3. The upper end of this bolt is pivoted to one end of a lever, c^7, rigidly fixed at a point between its ends upon the other end of the rock-shaft b^8, projecting through partition *c* into chamber C. To the other end of the lever c^7 is pivoted at its upper end a flat bar, c^8, having a suitable handle or offset at its lower end, and sliding vertically in guides c^9. As already said, the lever c^7 is fixed at a point between its ends upon the rock-shaft, and as the arm b^7 at the first end of the rock-shaft projects in a direction opposite to that of the end of the lever c^7, which bears the bolt c^5, and as the bar c^8 is on the opposite end of this lever, it follows that when the bar is pushed up the door *b'* will be unlocked and the door *c'* locked, and when the flat bar is pulled down the door *b'* will be locked and the door *c'* unlocked. One side of the flat bar has two square notches or recesses, c^{10}, and in the staples on the inner side of the partition *c* is a horizontally-sliding bar, c^{11}, which is forced against the bar by a spring, c^{12}, and will take into either recess as the bar is pushed up or pulled down and lock the bar in either position. Upon the other side of the flat bar is a single square notch or recess, c^{13}, and in staples on the inner side of the partition and extending across the same behind the flat bar, where it is notched to permit lateral movement thereon, and above the first horizontally-sliding bar to the door, is another horizontally-sliding bar, c^{14}, which is forced by a spring, c^{15}, and has its end at the door beveled with the bevel outward, so that pressure of the edge of the door against it slides this bar against its spring, and when the door is closed thus holds it. When the flat bar is pulled down and the inner door is opened, the spring pushes this horizontally-sliding bar toward the door, and a projection,

c^{16}, on this bar enters the recess c^{13} in the flat bar. The projection c^{16}, engaging with the recess c^{13}, prevents the flat bar from being pushed up to unlock the second door, and the horizontally-sliding bar c^{14} can only be moved to free the flat bar c^{8} by closing the inner door. This is to prevent the agent in the inner chamber, if he has carelessly left the inner door open, from thoughtlessly unlocking the second door.

In addition to the fastenings of the door to the inner chamber just described or those connected with the door to the middle chamber, there will be separate and independent fastenings, such as a bolt or bolts, or the button indicated at c^{17}, the purpose of this independent fastening being to be able to imprison, as before described, an unauthorized person who has entered the middle chamber. The partition c between the middle and inner chambers is of metal, or is covered or sheathed on both sides with metal plates of sufficient thickness to render it bullet-proof, and the door in this partition is rendered bullet-proof in the same manner.

As before indicated, the rest of the inner chamber is also to be bullet-proof, either by the nature and thickness of the material of which the end of the car itself is to be constructed or by lining and sheathing it with metal. The metallic lining of the chamber is indicated by the mark c^{18}.

Like the other compartments, the inner compartment has also a strongly-barred window at each side marked c^{19}; but in addition each window is provided with a sliding inside metallic shutter, c^{20}, which is held in closed position by a spring-catch, c^{21}, or other suitable device.

In the bullet-proof partition c at one side of the door are journaled at their ends in a horizontal plane and at a convenient height from the floor of the car one or more pivot-blocks, c^{22}, having journaled in them transversely other blocks, c^{23}, having pivots c^{24}, presenting inner blocks to the first or outer blocks, the first blocks being formed with the transverse slots c^{25} at right angles to the said pivots, these slots increasing in width from their centers toward each end. The inner blocks are formed with retaining-apertures, such as transverse screw-threaded apertures c^{26}, registering with the slots c^{25} in the outer blocks, and into these retaining or threaded apertures are inserted the barrels of suitable fire-arms, such as breech-loading revolvers c^{27}, the said arms being formed with retaining means—such as exterior screw-threads—for holding them in position and preventing them from slipping out by their weight or from being knocked out by blows upon their outer ends.

The roof, marked D, is preferably peaked, and between the upper edges of the partitions a, b, and c and the roof are provided the small spaces d, to allow circulation of air for ventilation, these spaces being protected by suitable grating or bars, d'.

While I have thus minutely described the specific means for carrying my invention into effect, it will of course be obvious that the same may be somewhat varied without departing from the spirit thereof.

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

1. A safety-car consisting of three compartments—namely, an outer narrow compartment, a middle compartment, and an inner compartment—the doors between the said compartments being provided with locking devices operated from the inner compartment.

2. A railway-car having three compartments, the doors between the said compartments being provided with locking devices and connected by means of a shaft in such manner that the motion of one locking device is communicated to the other, substantially as described.

3. A railway-car divided into compartments, devices locking the doors between the said compartments, and a common lever situated in an inner compartment and operating said locking devices.

4. A railway-car divided into compartments, the partitions between the compartments being provided with doors locked by means of hasps, staples, and bolts, the bolts of the two doors being so arranged that they shall move simultaneously in opposite directions in order that one may be locked simultaneously with the unlocking of the other, and a lever operating both bolts.

5. In a railway-car, the compartments, doors leading into the same, and the mechanism for locking the doors, consisting of the vertically-sliding bolts, the lever for operating these, and the spring-bar for holding the bolts in the desired position, substantially as described.

6. In a railway-car, the compartments, doors to the same, and mechanism for locking the doors, consisting of vertically-sliding bolts and the spring sliding bars for holding the parts in any desired position, one of the sliding bars being provided with a beveled end engaged by a door to release the parts when the door is closed, substantially as described.

7. The herein-described means for locking a door and simultaneously unlocking a distant door, consisting of vertical locking-bolts and the operating-lever, to which one of the said bolts is connected directly and the other indirectly by means of a rock-shaft and arm, substantially as set forth.

8. The means herein described for locking a door and simultaneously unlocking a distant door, consisting in the vertical locking-bolts, the operating-lever, to which one of the said bolts is connected directly, and to which the other is connected by means of the rock-shaft and a second lever, and the spring slide-bars for locking the parts, substantially as described.

9. A safety-car divided by transverse partitions into a narrow outer compartment, a middle receiving-compartment formed with a

ged receiving-door, and an inner compartment or magazine, there being a lever and intermediate devices for locking from the inner compartment the doors in the partitions between the compartments.

10. The safety-car divided by the transverse partitions, the inner one of which, with its door, bullet-proof, into the narrow outer chamber, the middle receiving-chamber having the ged receiving-door, and the bullet-proof amber, safe, or magazine, and the lever and termediate devices for locking the doors in e partitions from the inner chamber or magine.

11. A safety express-car having a bullet-proof partition, a block journaled therein, and another or inner block pivoted in a different plane in the first block and perforated for a fire-arm, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

SAMUEL WORKMAN.

Witnesses:
ALEX. GRAHAM,
F. W. DOUGLAS.