(No Model.) 3 Sheets—Sheet 1.

A. W. ZIMMERMAN.

CAR DOOR LOCK.

No. 303,101. Patented Aug. 5, 1884.

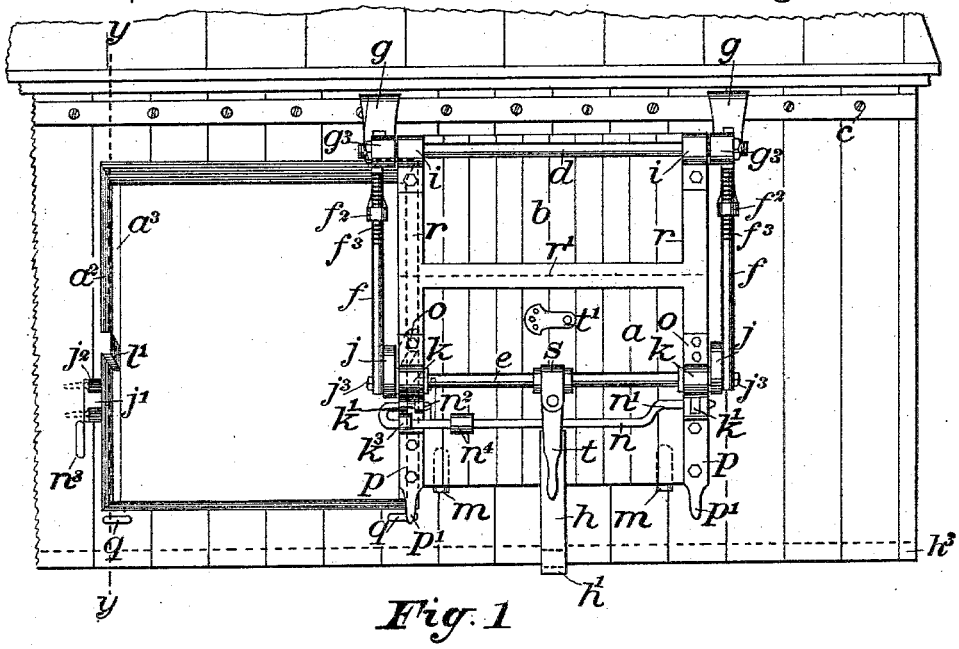

Fig. 1

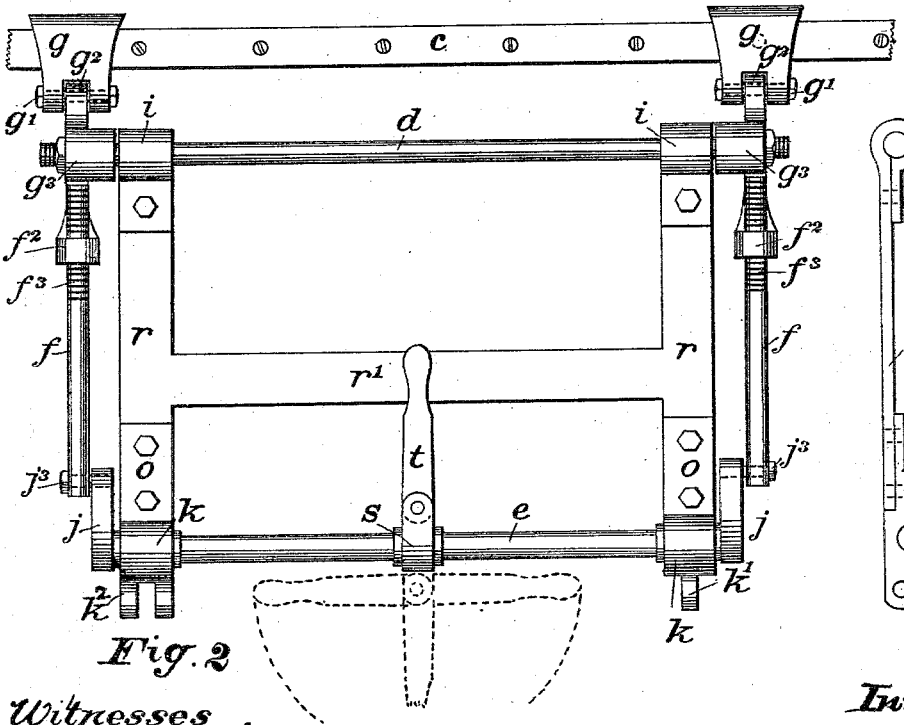

Fig. 2

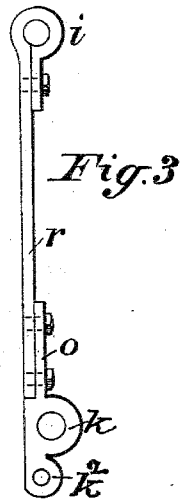

Fig. 3

Witnesses
I. D. Clark
C. C. Clark

Inventor
Arnold W. Zimmerman
By Wm. Zimmerman
Attorney

N. PETERS. Photo-Lithographer, Washington, D. C.

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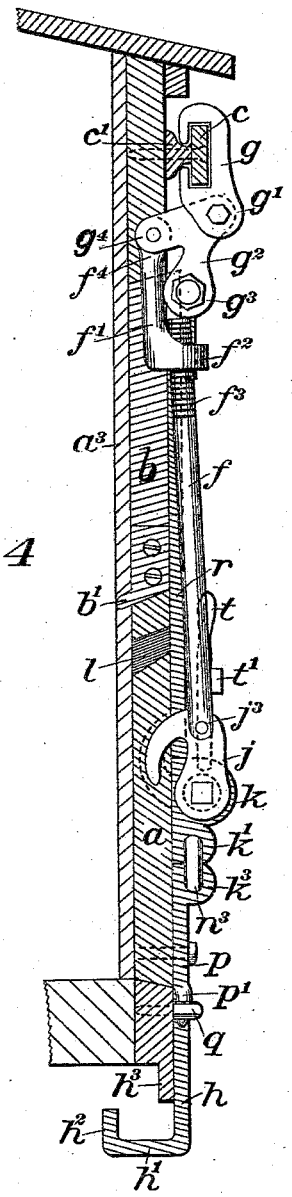
Fig. 4



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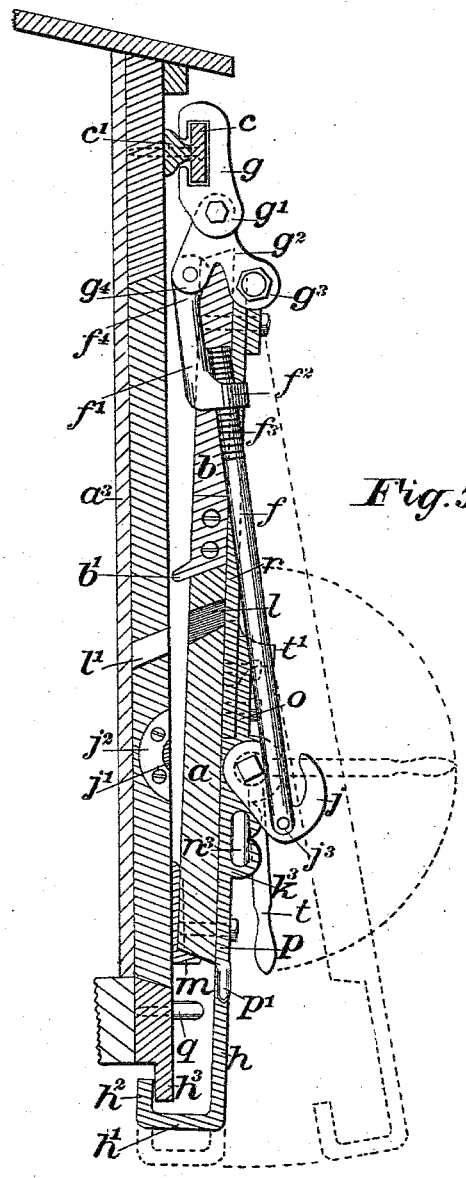

Witnesses;
J. D. Clark
C. C. Clark

Inventor
Arnold W. Zimmerman
By Wm Zimmerman
Attorney.

N. PETERS. Photo-Lithographer, Washington, D. C.

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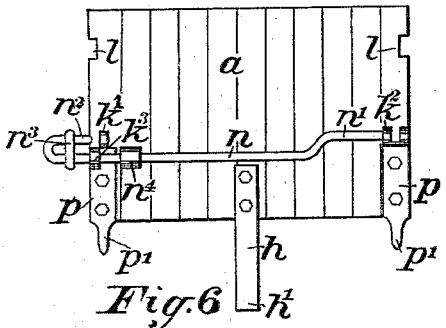

Fig. 6

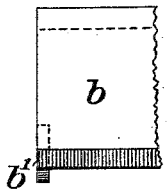

Fig. 7

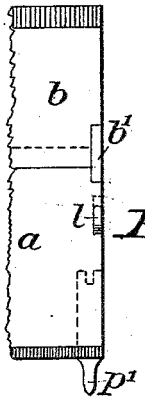

Fig. 8

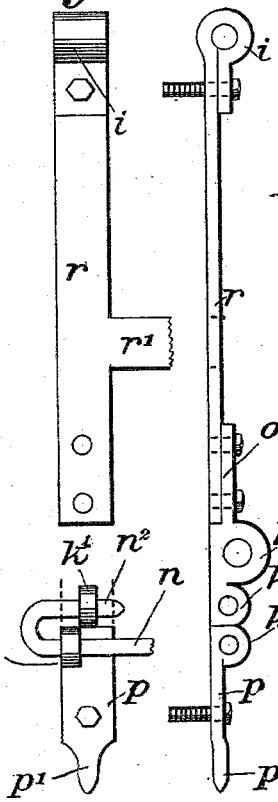

Fig. 9

Fig. 10

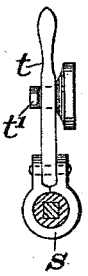

Fig. 13

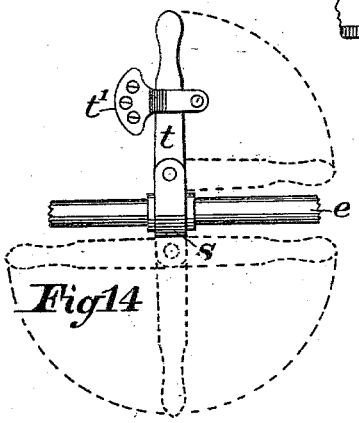

Fig. 14

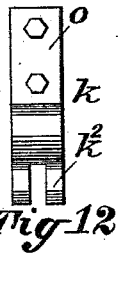

Fig. 12

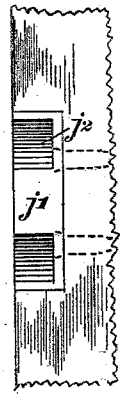

Fig. 16

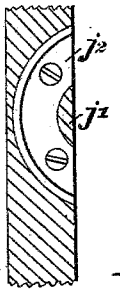

Fig. 17

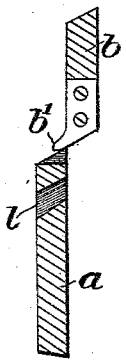

Fig. 15

Fig. 18

Witnesses
J. D. Clark
C. C. Clark

Inventor
Arnold W. Zimmerman
By Wm. Zimmerman
Attorney

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

ARNOLD W. ZIMMERMAN, OF CHICAGO, ILLINOIS.

CAR-DOOR LOCK.

SPECIFICATION forming part of Letters Patent No. 303,101, dated August 5, 1884.

Application filed March 7, 1884. (No model.)

To all whom it may concern:

Be it known that I, ARNOLD W. ZIMMERMAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Car-Door Locks, which are fully set forth in the following specification, reference being had to the accompanying drawings, forming a part hereof, and in which—

Figure 1 is a side elevation with the entire door fully open. Fig. 2 is an enlarged side view of the hinges and locking mechanism of the upper door. Fig. 3 is an end view of the parts *r o*. Fig. 4 is an end view of the door and lock closed, the car being cut on the plane *y y* of Fig. 1. Fig. 5 is an end view of the door and lock opened, and the car cut on the plane *y y* of Fig. 1. Fig. 6 is a side view of the lower door with its part of the locking mechanism. Fig. 7 is an interior view of the lower front corner of the upper door, showing the bevel of the lower edge. Fig. 8 is an interior view of the front edge of the doors *a b*, showing the place of the spur *b'* and slot *l*. Fig. 9 is a side view of the strap *r* and a part of the strap *r'*, attached thereto. Fig. 10 is an end or edge view of the parts *r* and *p*, united by a piece, *o*, which hinges upon the part *p*. Fig. 11 is a side view of the lower part of the hinge *p* and stop, with the hook part of the rod *n* in place. Fig. 12 is the piece *o*, uniting *r* and *p* in front view. Fig. 13 is an end view of the shaft *e* and lever *t*. Fig. 14 is a side view of the lever *t* and catch *t'* and a part of the shaft *e*. Fig. 15 shows the front edge of the doors *a b* and hook or spur *b'*, resting on the lower door when the upper door is open. Fig. 16 is an end view of the pin *j'* and socket j^2. Fig. 17 is a side view of the pin *j'* and socket j^2, fastened in place in the edge of the door-frame. Fig. 18 is end view of the hook *h*.

Like letters of reference indicate like parts.

The object of my invention is to improve the details of construction of a car-door fastener patented to me August 7, 1883, and numbered 282,598, and also the door patented to me July 10, 1883, and numbered 281,170.

I make no claim in this application to the car-door mechanism herein shown, as it forms the subject of claims in another application filed of even date with this, and numbered 123,319.

a is the lower and *b* the upper part of my door provided with my improved lock. *c* is a flat bar of iron, fastened to the side of the car under the eaves, so as to form a sliding track for the hooks *g*. The bar *c* is fastened to the car with screws of which the head is flush with the face of the bar *c*, and which pass through a post or bracket, *c'*, into the wall of the car. This construction of track *c* permits the use of a lighter bar for track than can be made of a round rod, as it can only be supported at its ends, and this also permits the use of a sliding hook, *g*, which cannot be removed, and will not interfere with the posts *c'*.

To the lower end of the hook *g* is hinged a bell-crank lever, g^2, through the lower end of which passes a rod, *d*, which forms, with the eye *i* of the strap *r*, a hinge upon which hangs the strap *r*, which is permanently fastened to the door *b*. Said straps overlap the door *a* to near its lower end, so as to bring the lever *t* within easy reach, but is not fastened thereto. The strap *r* may be either formed into one part of a hinge or, preferably, bolted to a piece, *o*, which is formed into one part of a hinge, k^2.

To the lower door is bolted a strap, *p*, which has its upper end formed into the opposite part of a hinge, *k'*, to fit into k^2, and its lower end is formed into a pin, *p'*, which fits into a staple or eye-bolt, *q*, in the side of the car. The parts *o* and *p* are united by the pins $n' n^2$, which form part of a rod, *n*, and the part n^2 forms the end of a hook, into which its end of the rod *n* is formed, which is kept in its place by the lug k^3, through which the rod *n* passes, and the pin *n'* is kept from falling out by not being withdrawn from the part k^2, as shown in Fig. 1. By pushing said rod back and forth the pins $n' n^2$ unite or disconnect the parts *p* and *o*, and thus unite or separate the parts *a* and *b* of the door. The rod *n* has a knob, n^4, which forms a handle and also a stop, which strikes against the strap *p*, which prevents its moving too far. When the doors are separated, by moving the rod *n*, its hooked end passes into a staple, n^3, and thus locks the lower door so that it cannot be lifted out of its place.

Through the bearing *k* passes a shaft, *e*, to

the ends of which, outside of the bearing k, are attached hooks j, which catch over the pin j' and pass into the channel or socket j^2 of a metal piece, which is let into the walls just outside of the door, as shown. This arrangement will hold the lower door securely in place.

To the outside of the hook j is fixed a pin, j^3, so as to form a crank-pin, upon which plays the lower end of the rod f. The upper end of said rod is provided with a thread, f^3, which screws into a nut, f^2, which forms a part of the hanger f'. The hanger f' is united to the hook g^2 by a hinge-joint, f^4, and pin g^4.

To the center of the shaft e is attached a strap, s, between the ends of which plays a lever, t, in a plane which passes through the lever and axis of the shaft e, and by which said shaft is turned and the hooks j caught upon or released from the pins j'.

To the lower and front corner of the upper part of the door b is attached a spur, b', which extends inward from the inside face of the door. Said spur rests upon the top of the door a when the upper door is opened, and thereby holds the lower door from being lifted out and the upper door from swinging out at its lower end, the top of the lower door being beveled inward and downward, as shown, to hold the upper door from swinging out when opened, its lower end fitting upon that of the lower door.

To the center of the lower door is attached a hook, h, of which the horizontal part h' is long enough to let the lower end of the door swing out so as to slide back clear from the side of the car when the part h^2 strikes against the inside of the guide or projection h^3, which extends below the bottom of the car so as to form a guide for said hook.

To the side of the car are attached steps or lugs m, upon which the door rests when opened, and which keep it in place, ready to be closed.

To the door is attached a hook, t', into which the lever t passes to hold the parts in place, and where it may be locked or otherwise secured.

The part f', as shown in Figs. 4 and 5, passes into the wall of the car when the door is closed, and for that purpose a place is cut out of the wall for it.

To open the entire door, pull down the lever t into the dotted position, as shown in Fig. 2. This motion will pull down the rod f and throw the crank g^2 from the position shown in Fig. 4 to that shown in Fig. 5, and with it the upper end of the door will pass both outward and upward and lift the lower end of the door out of its stops, so that it may be swung out, so that the parts h^2 h^3 will strike when it may be shoved back or open.

To open the upper door only, pull the pins n' n^2 out of the hinges, and then operate the lever and other parts, as before. By separating the hinges, the hooked end of the rod n will pass into the staple n^3 and hold the lower door from being lifted up.

To release the lower end of the door so that it may swing out, as shown in the dotted outline in Fig. 5, bring the lever t back to its original position after h^2 and h^3 are in contact. This will throw h^2 below h^3, and the door will then swing out, as shown. The beveled side of the door-frame is shown by a^2, and the stop against which the door strikes in closing by a^3.

What I claim is—

1. In a car-door lock, the bar c and hook g, provided with swinging bell-crank g^2, whereof the lower and outer end is hinged to the upper part of a door, and its inner end connected to a hinged and adjustable rod, f, of which the lower end is attached to a crank operated by a lever, t, connected to said crank, and the lower end of said door is held by stops, substantially as specified.

2. In combination with the separable doors a b, the parts p r, staple q, bell-crank g^2, and sliding hook g, hinged and adjustable rod f, crank j^3, hook j, pin j', shaft e, and lever t, substantially as specified.

3. In a sliding and separable door, a locking mechanism consisting of the separably-hinged parts p r, passing into staples q below, and hinged to bell-crank levers above, to the inner end of which is attached an adjustable and hinged rod, f, connecting with a crank, j^3, and hook j, catching on pin j', operated by a lever, t, substantially as specified.

4. In a car-door lock, the mechanism for both lifting and throwing the door outward from its frame, in combination with a hinged lever, t, on a shaft, e, operating in a plane through said lever and the axis of the shaft, substantially as specified.

ARNOLD W. ZIMMERMAN.

Witnesses:

WM. ZIMMERMAN,

ALBERT BOTSFORD.