

936,908.

Patented Oct. 12, 1909.
 2 SHEETS—SHEET 2.

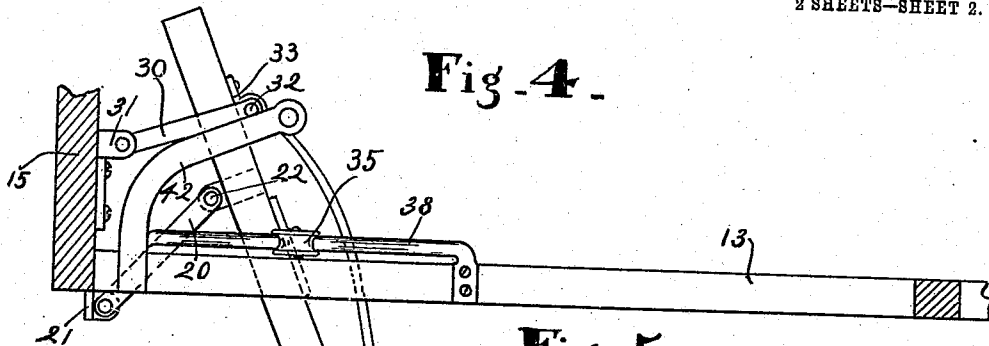


Fig. 4.

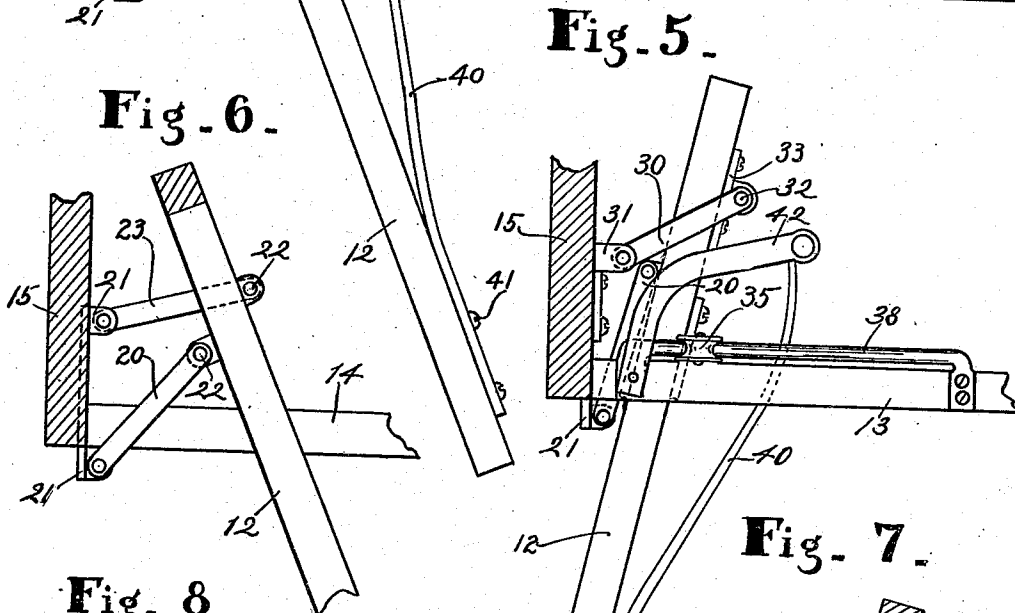


Fig. 5.

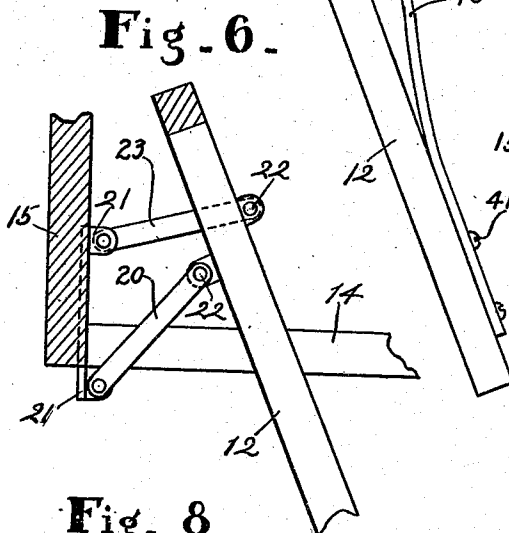


Fig. 6.

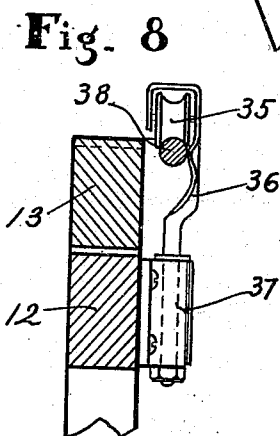


Fig. 7.

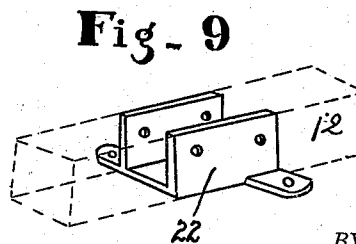


Fig. 8.

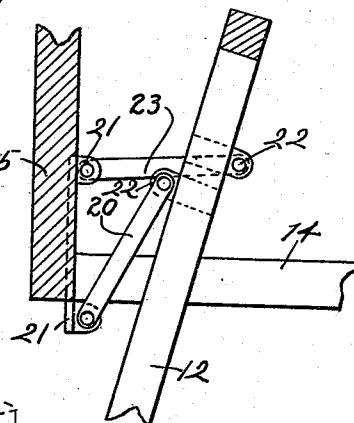


Fig. 9.

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SPRING-DOOR.

936,908.

Specification of Letters Patent.

Patented Oct. 12, 1909.

Application filed July 20, 1908. Serial No. 444,398.

To all whom it may concern:

Be it known that I, WILLIAM H. JORDAN, of Knightstown, county of Henry, and State of Indiana, have invented a certain new and useful Spring-Door; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like numerals refer to like parts.

10 The object of this invention is to provide a simple and effective means for mounting a door, which holds the door closed, half open, or entirely open, as desired.

15 The invention was made with special reference to doors for carriages where it is desirable that the door be held automatically in the positions mentioned. It prevents the slamming of the door and holds it closed. While a person is entering or leaving a carriage, it holds the door entirely open, and, while persons in the carriage are talking to persons outside, the door may be held half open. But it is not desired that the invention be limited to carriage doors, as it may be used elsewhere than in carriages.

20 Another object of the invention is to so mount the door that, as it opens, a portion of the door will more and more project inwardly and the door will not project so far outwardly as if mounted in the ordinary way. This renders it of peculiar value in carriages because with this mounting the door when open will not project outwardly so far as to be interfered with by the wheels or fenders and yet the portion of the door which projects inwardly will in no manner interfere with persons entering or leaving the carriage.

25 One feature of the invention consists of pivotal connections from the casing to the upper and lower parts of the door at points between the ends of the door, so that if the door is opened a portion of the door will gradually project more and more inwardly and the remainder of the door not project outwardly as far as ordinary doors.

30 Another feature of the invention consists in providing a pair of pivotal connections for the lower part of the door and also a pair for the upper part of the door, said pivotal connections cooperating with each other to give the desired movement of the door. Along with the foregoing is the provision of a roller connection between the door and a track on the casing above, to form one of the pivotal connections, whereby it will not

only perform the function of a pivotal connection but support the weight of the door.

Another object of the invention consists in combining with the pivotal connections referred to a spring construction for holding the door in the various positions to which it may be moved.

The nature of this invention will be understood from the accompanying drawings 65 and the following description and claims:

In the drawings Figure 1 is a side elevation of a carriage top with the door closed, a portion of the top of the device being broken away: Fig. 2 is a horizontal section on the line 2—2 of Fig. 1 showing the positions of the parts on the door when closed and the released position of the spring in dotted lines. Fig. 3 is a horizontal section on line 3—3 of Fig. 1 showing the lower 75 pivotal connections. Fig. 4 is the same as Fig. 2 with the door partially open. Fig. 5 is the same with the door entirely open. Fig. 6 is the same as Fig. 3 with the door half open. Fig. 7 is the same with the door 80 entirely open. Fig. 8 is a vertical section on the line 8—8 of Fig. 1. Fig. 9 is a detail of the clip for holding the lower pivots, part of the door being shown by dotted lines.

In detail the drawings show a carriage 85 body 10 with a top 11 having a door 12 mounted within a suitable casing in the carriage top. This casing consists of an upper part 13, a lower part 14, a front side part 15 to which the door is pivoted, and a rear 90 part 16 to which the door is latched. The lower pivotal sections appear in Figs. 3, 6 and 7 and include an outside connecting bar 20 pivoted at one end to a plate 21 secured to the side 15 of the casing. Said bar 95 20 at its other end is pivoted to a clip 22 that is secured to the lower part of the door. The clip 22 is secured to the bottom of the door between its front and rear ends and, therefore, somewhat removed from what 100 may be called the pivoted end of the door. The connecting bar 20, when the door is closed, is substantially parallel with the door. Its companion connecting bar 23 is on the inside of the door, being pivoted at 105 one end to the clip 22 and at the other end to the plate 21. The inner connecting bar 23 is not parallel with the door when closed but is arranged as shown in Fig. 3 with one end pivoted to the part 15 of the casing 110 rather remote from the door and the other end pivoted rather close to the door but

nearer the pivotal edge of the door than the connection between the bar 20 and the clip 22, so that the two bars 20 and 23 are substantially of the same length with the ends thereof, which are secured to the casing, being farther apart than the ends thereof which are pivoted to the door, although the latter pivots are farther apart than the width of the door. This arrangement enables said pivoted bars to assume the position shown in Figs. 6 and 7 when the door is open partially or entirely. When the door is being opened, the bar 20 gradually changes from a parallel position with the door to one at right angles when the door is substantially half open; and the further movement of the door to the open position again brings the bar 20 almost parallel with the door but with its free end extending toward the pivoted end of the door instead of away from the pivoted end of the door as when the door is closed. The inner and inclined bar 23 is pivoted at a lower level than the door so that as the door opens the pivoted end thereof moves inwardly and over the bar 23 so that the angle between the bar 23 and the door diminishes from the position shown in Fig. 2 until the two parts are parallel then the further opening movement of the door brings the door over the bar 23 at a right angle or more as shown in Fig. 7.

The door at its upper end has also two pivotal sections between the ends thereof and removed somewhat from what may be termed the pivotal end of the door. Thus there is a connecting bar 30 corresponding practically with the connecting bar 23 below and of the same length and similarly mounted although it is above the door instead of below it. One end of the bar 30 is pivoted to the bracket 31 on the door casing inside the door. The other end of the bar 30 is pivoted by the pin 32 to the plate 33 on the inner side of the top of the door, see Fig. 5. The other pivotal connection at the top is very different from the corresponding connection at the bottom. It has a roller 35 mounted on an upwardly projecting arm 36 rotatably mounted in the bracket 37 which is secured to the inner surface of the top of the door, more remote from the pivotal end of the door than any of the connections heretofore described. The roller rides upon the rod or track 38 secured to the part 13 of the door casing so as to lie inside thereof parallel with the door when closed. This roller performs two or three functions. It is in the nature of a pivotal connection corresponding somewhat with the lower pivotal bar 20. It supports the weight of the door so as to take the weight of the door off of the other pivotal connections. The rod 38 serves as a guide to regulate the position of the door as it is opened and closed.

In addition to the pivotal connections

which have been described a spring is provided to cooperate with them in moving the door to various positions and holding the same in those positions. To that end the flat spring 40 is fastened by the screws 41 near the free edge of the door to the inside of the top thereof, so that the other or free end of the spring 40 will tend to stand outwardly from the door, as shown in Fig. 2 by dotted lines. But the free end of the spring is held inwardly toward the door in a permanent position by the arm 42 that projects inwardly from the part 13 of the casing, see Fig. 2.

The door will operate without the spring 40, by reason of the pivotal connections, and, if there is sufficient friction, the door will stay in the position to which it may be moved. Thus, if the door be half open, as shown in Fig. 4, the lower pivotal connections will assume the position shown in Fig. 6 and the top pivotal bar 30 will assume substantially the same position as the bar 23 below, while the roller 35 will move on its track toward the part 15 of the casing. When the door is entirely opened the lower parts will have the position shown in Fig. 7, the upper pivotal bar 30 will be situated much as the bar 23 below and the roller 35 will be moved substantially as near the part 15 of the casing as the door will permit, as shown in Fig. 5. Therefore with this mounting there is no hinged or other means secured to the edge of the door but the pivotal connections are secured between the two ends of the door so that one end of the door projects inwardly more and more as the door opens. The position of these pivotal connections may be modified and the farther they are removed toward the middle of the door, the more the door would project inwardly as it is opened. These peculiarities in the movement of the door result from the double pivotal connections at the top and bottom of the door which are situated between the ends of the door. But when the spring 40 is added it tends to hold the door in its open and closed positions and to spring them in those positions and the neutral position of the door is reached when the door is about half open so the door will remain in that position when desired. Thus it is seen that I have a door mounting free from coil springs and so arranged that the door will not project outwardly from the casing while being opened as far as ordinary doors and it will stay in position, at least three positions to which it may be moved.

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

1. The combination with a door casing and a door, of bars pivotally connected with the inside of the door near the top and bottom and between its ends and also with the side of the door casing remote from the

door when the door is closed, a bar pivotally connected with the outside of the door casing near the bottom and between the ends thereof and with the door casing, a roller
5 mounted on the upper part of the door between the ends of the door, and a track secured to the door casing above the door on which said roller is mounted, substantially as set forth.

10 2. The combination with a door casing and a door, of pivotal connections between the casing and the door at points between the ends of the door which draw the door toward the side of the casing and cause a
15 part of the door to project inwardly more and more as the door is being opened, an arm extending inwardly from the door casing, and a flat spring pivoted to the inner end of said arm at one end and secured to
20 the inner surface of the door near its free end, substantially as set forth.

3. A combination with a door casing and a door, of bars pivotally connected with the

inside of the door near the top and bottom and between its ends and also with the side
25 of the door casing remote from the door when the door is closed, a bar pivotally connected with the outside of the door casing near the bottom and between the ends thereof and with the door casing, a roller mount-
30 ed on the upper part of the door between the ends of the door, a track secured to the door casing above the door on which said roller is mounted, an arm secured to the door casing above the door and projecting inwardly
35 and curved away from the side of the casing, and a flat spring pivoted to the inner end of said arm and its other end secured to the door near its free end.

In witness whereof, I have hereunto af-
40 fixed my signature in the presence of the witnesses herein named.

WM. H. JORDAN.

Witnesses:

CHARLIE E. CLARK,
CHARLIE W. FITHIAN.