March 29, 1932. J. STURM 1,851,784

OPENING AND CLOSING DEVICE FOR GARAGE DOORS

Filed Dec. 6, 1929 2 Sheets-Sheet 1

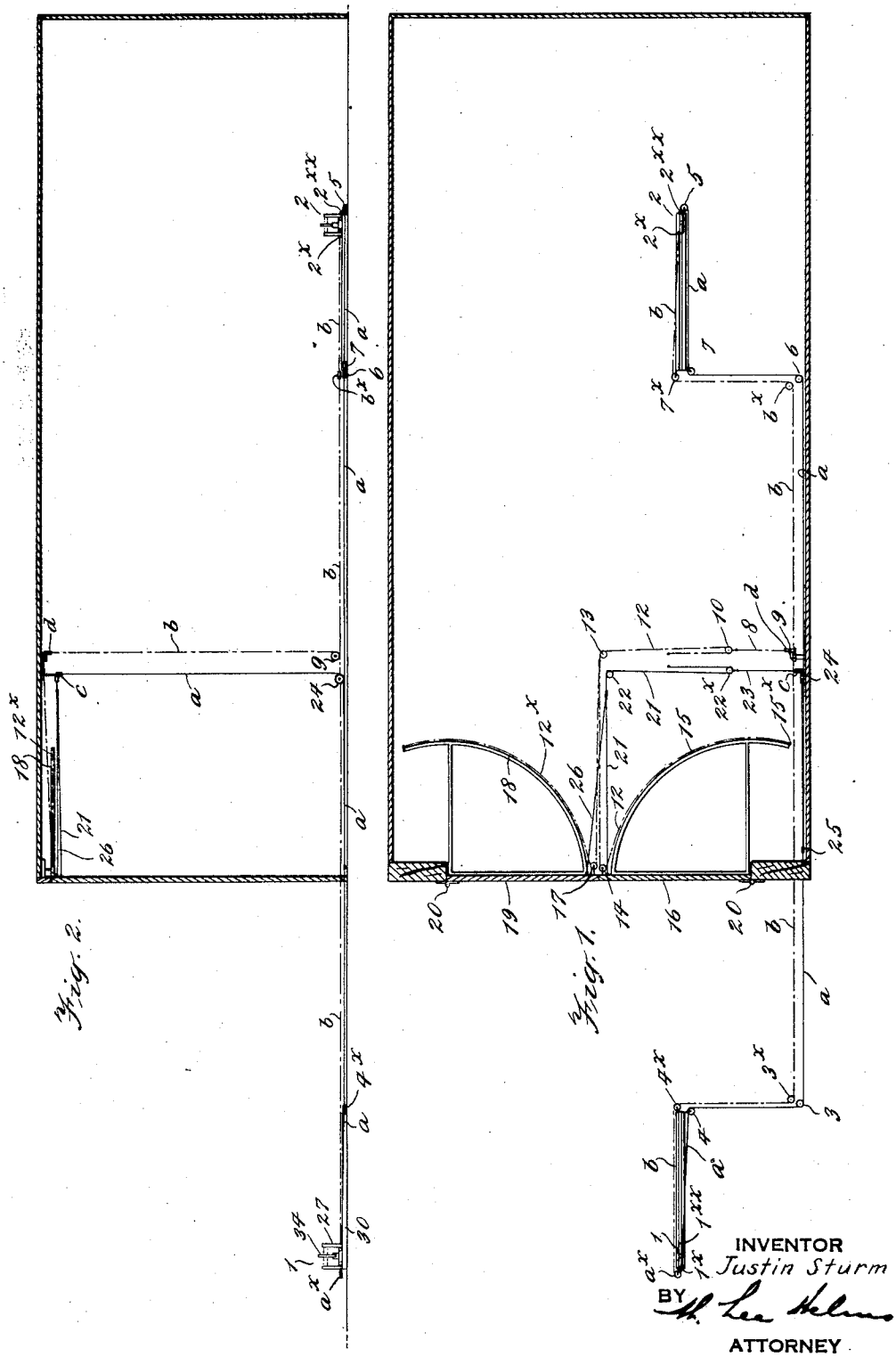

Fig. 2.

Fig. 1.

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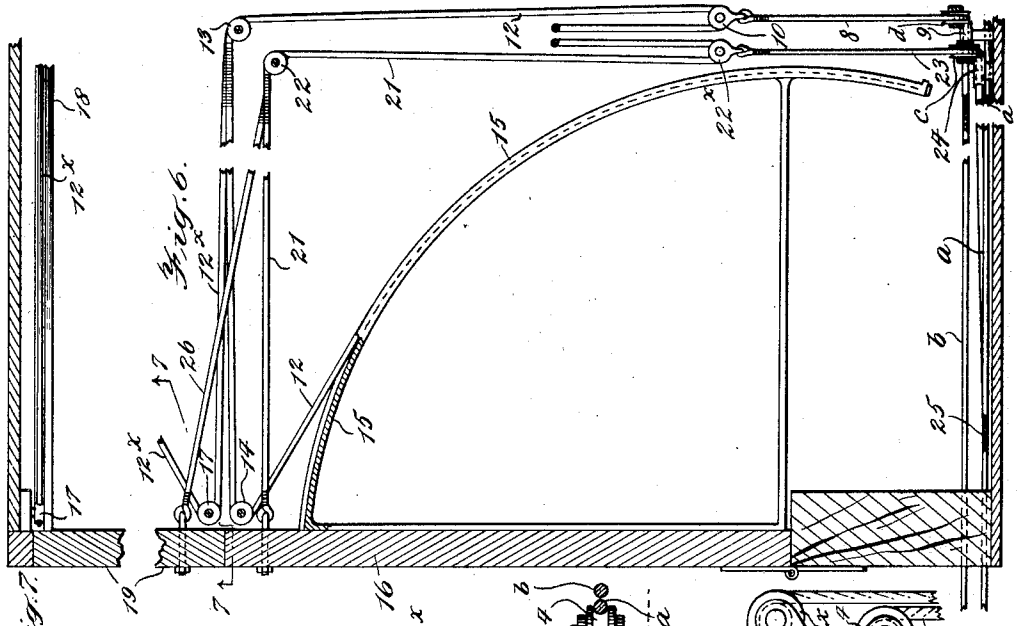

Fig. 7.

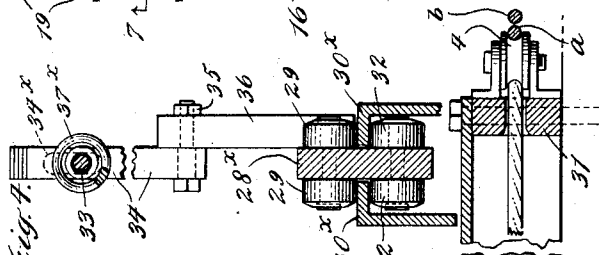

Fig. 4.

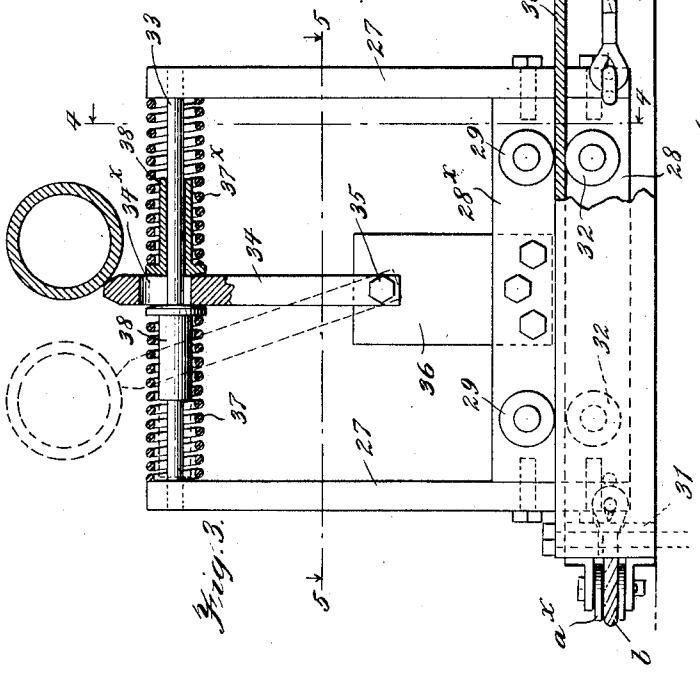

Fig. 3.

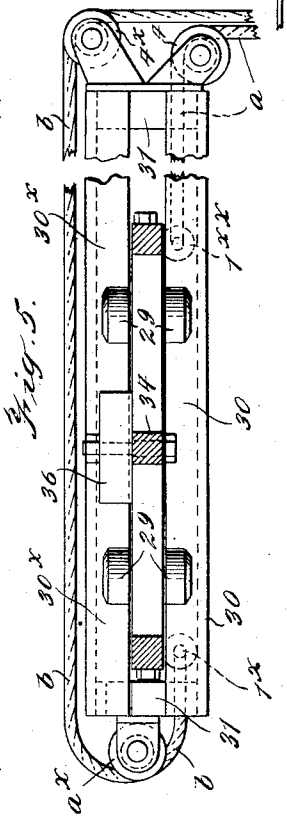

Fig. 5.

Fig. 6.

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Patented Mar. 29, 1932 1,851,784

UNITED STATES PATENT OFFICE

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OPENING AND CLOSING DEVICE FOR GARAGE DOORS

Application filed December 6, 1929. Serial No. 412,167.

The object of the present invention is to provide simple and effective means for opening and closing garage doors through the propelling force of the automobile as it approaches the garage, and after it leaves the latter.

The invention will be described with reference to the accompanying drawings, in which

Fig. 1 is a schematic plan view of an embodiment of the invention, and

Fig. 2 is a view in elevation of the same;

Fig. 3 is a view in sectional elevation of the carriage, trackway and associated elements;

Fig. 4 is a sectional end elevation of the same;

Fig. 5 is a sectional plan view of the carriage, trackway and associated elements, section being taken on the line 5—5, Fig. 3;

Fig. 6 is a sectional plan view of a garage structure showing one of the hinged garage doors, and a fragment of the second door, illustrating the cable connections; and

Fig. 7 is a fragmentary vertical section on the line 7—7, Fig. 6.

The device operates on the principle of an endless cable and two carriages, one exterior the garage, and one within the garage. The carriages are connected to the cable in such manner that the movement of one carriage, through contact by and power of the automobile as it approaches the garage doors, will actuate the cable to open the doors. This actuation of the cable will move the second carriage within the garage to such position that when the automobile contact element meets the inner carriage, and propels it, a reverse movement will be given to the cable to close the doors. The construction is such that the automobile propels the carriage to a final point, and then the contact member of the automobile is enabled to slip past the carriage. When the automobile is backed out of the garrage, the contact member will act upon the carriage again to actuate the cable in such manner that the doors are opened. Also, when the automobile has left the garage, the contact member will meet the outer carriage and propel it to close the garage doors.

In the schematic view, Fig. 1, the outer carriage is indicated at 1, and the inner carriage at 2. The endless cable has an outer lead *a*, and an inner lead *b*. The inner lead *b* is secured to the carriage 1 at the point 1*x*, being first led over a fixed pulley *ax*, and the outer lead *a* is secured to the carriage 1 at 1*xx*.

The cable leads, *a* and *b*, may be led over the idler pulleys 3, 3*x* and 4, 4*x*. The inner cable lead *b* is connected to carriage 2 at 2*x*, and the outer cable lead *a* is connected to carriage 2 at 2*xx*, being first led over a fixed pulley 5. The cable leads, *a* and *b*, may be led over idler pulleys 6, 6*x* and 7, 7*x*.

To inner cable lead *b* is spliced a cable-extension 8 led over a guide pulley 9. At the end of cable-extension 8 is a pulley 10 entering the loop of door-operating cable-extension 12, the latter being led over a fixed pulley 13, over a second fixed pulley 14, and thence extending to the end of an arcuate channel-iron lever 15, the connection between cable extension 12, and the lever being indicated at 15*x*. The arcuate door-operating lever 15 is fixed upon garage door 16, preferably near the top thereof. Door-operating cable-extension 12 has spliced thereto an extension 12*x*, which is led over fixed pulley 17, and is connected to the end of an arcuate channel iron door operating lever 18, fixed to the second door 19. Both doors are hinged at 20.

To door 16 is secured a door-operating cable-extension 21, led over a fixed pulley 22, and formed with a loop which passes around a pulley 22*x* secured to the end of cable extension 23. Cable extension 23 passes over a fixed pulley 24, and is spliced at 25 to outer cable extension *a*.

Cable-extension 21 has spliced thereto a cable-extension 26, which is secured to garage door 19.

When the automobile is approaching the garage and meets carriage 1, the front bumper, front axle or other element of the car, selected for contact with the carriage, will propel the carriage longitudinally of its trackway. The carriage and trackway are shown in detail in Figs. 3, 4 and 5. In the embodiment of those figures, the carriage con-

sists of a frame having vertically disposed arms 27 connected by horizontal bars 28, 28*x*, the bar 28 carrying rollers 29 for contact with a trackway comprising the spaced rails 30, 30*x*. The rails 30*x* at their ends are connected to the end members 31. The rollers carried by lower bar 28, and indicated at 32 engage the lower horizontal faces of the trackway members for guiding purposes.

Supported by arms 27, is a guide rod 33 which rod projects through a passage way 34*x* formed in a post 34, the latter being pivoted at 35 upon a supporting block 36, secured to the carriage. At each side of the contact post is a coiled spring, the two springs being indicated at 37, 37*x*. Sleeves such as 38 may be interposed between the springs and the rod 33, the sleeves being short, however, relatively to the length of the rod. The inertia of each spring will be somewhat greater than the inertia of the load which the carriage is required to carry in opening and closing the garage doors.

The trackway at its left hand end has pivotally mounted thereon fixed pulley *ax*, and at its opposite end, the track way may carry pulley 4*x*. The inner cable lead *b* is led over pulley *ax*, and secured to the carriage at 1*x*.

Having described my invention, what I claim and desire to secure by Letters Patent, is as follows:

A door-opening and closing mechanism comprising a carriage, a supporting means on the carriage, opposed springs carried by the supporting means, a contact member pivotally mounted on the carriage and engaged at opposite sides by said springs, a second carriage and a second trackway, cable connections between the carriages whereby the movement of one carriage will effect a movement of the second carriage and cable connections adapted to be disposed entirely laterally of and also approximately at the top of a door and adapted upon movement of one carriage in a given direction, to open the door and movement of the second carriage in the same direction to close the door.

In testimony whereof, I have signed my name to this specification.

JUSTIN STURM.