

June 14, 1927.

1,632,028

I. F. KEISLING

DOOR OPERATOR

Filed Aug. 16, 1926

3 Sheets-Sheet 1

FIG. 1.

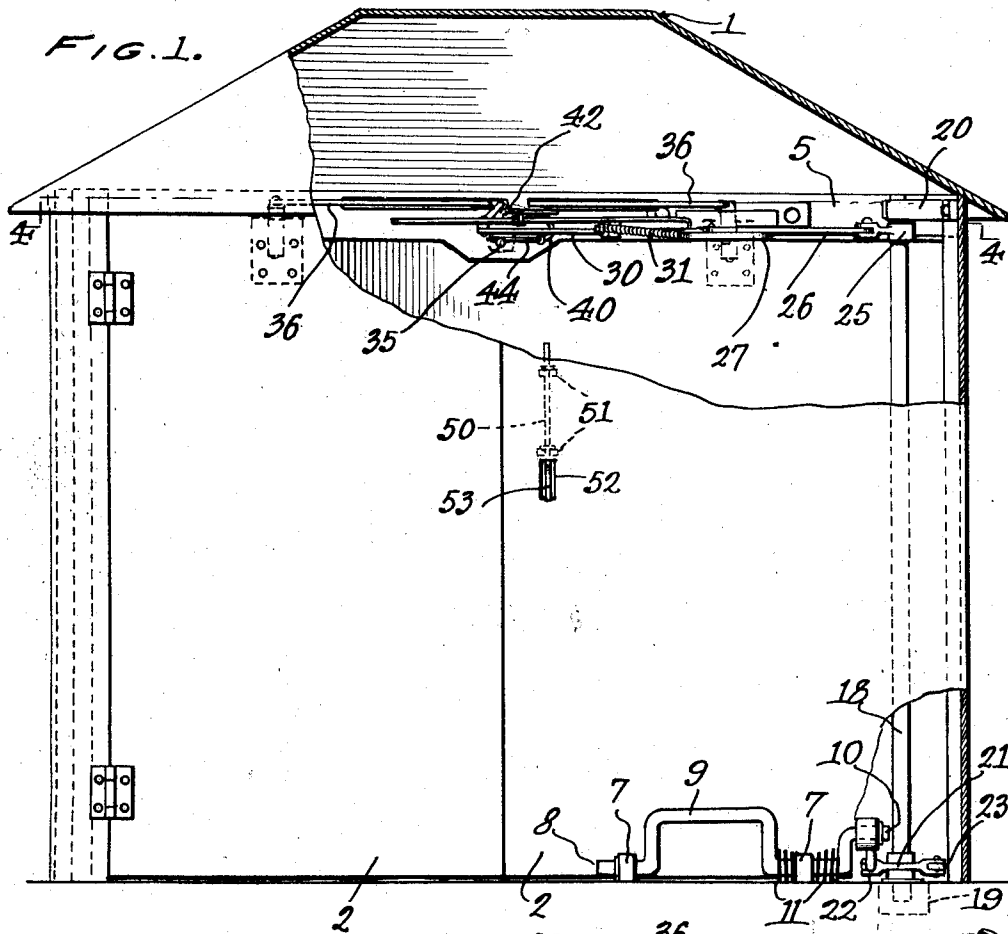


FIG. 2.

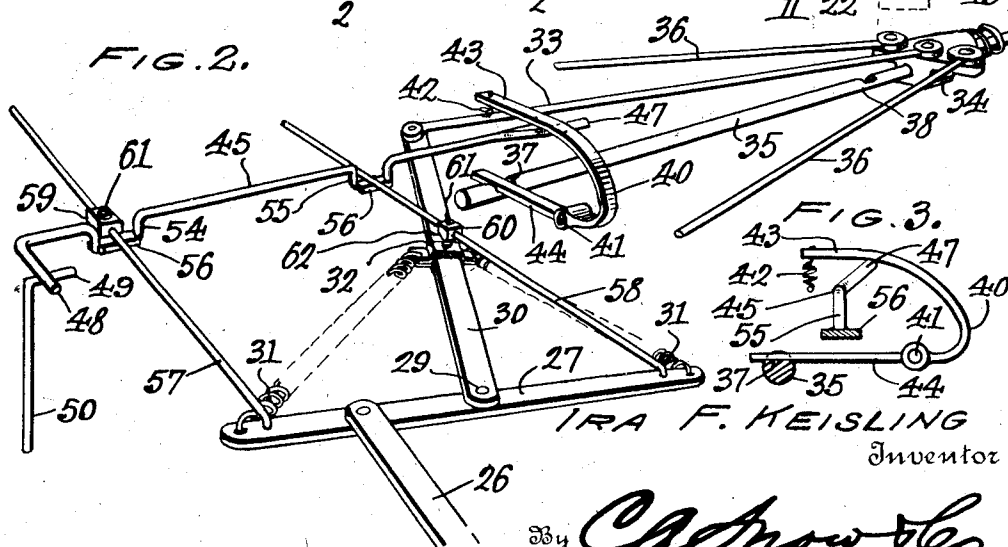
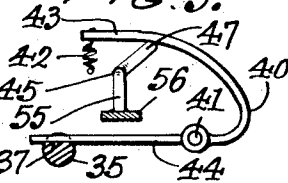


FIG. 3.



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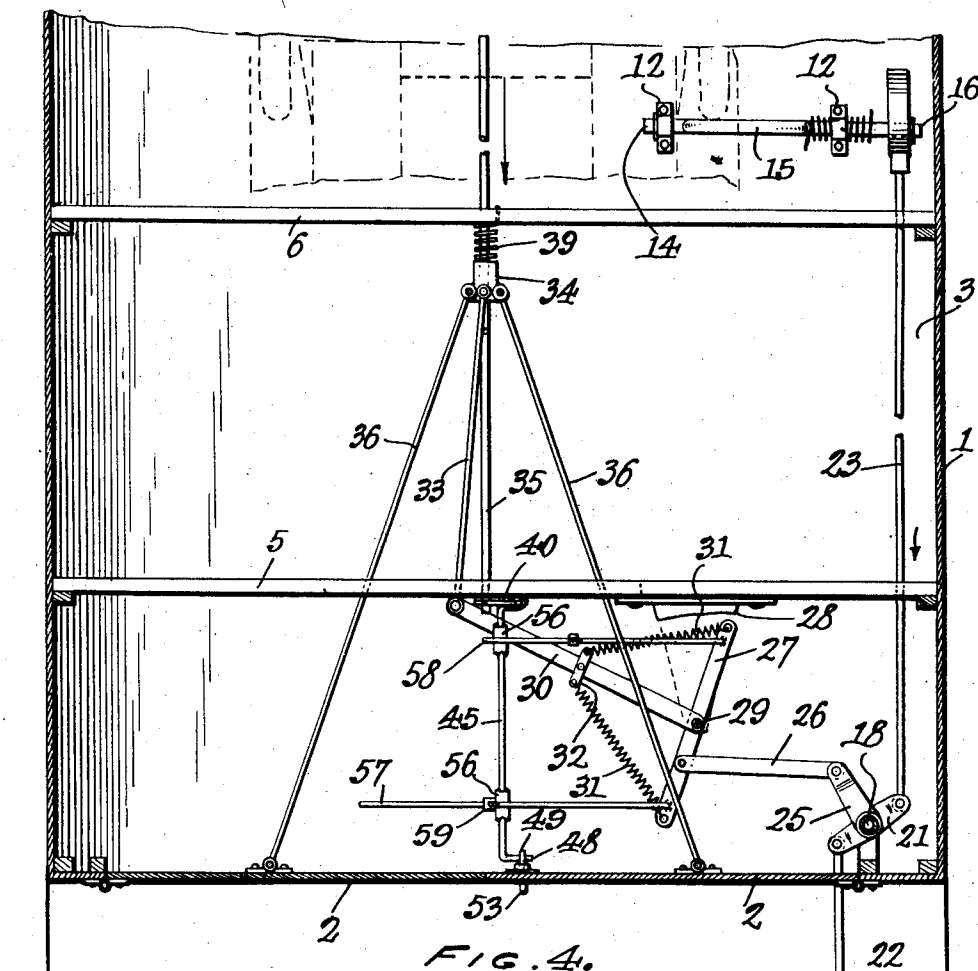
1,632,028

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3 Sheets-Sheet 2



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FIG. 5.

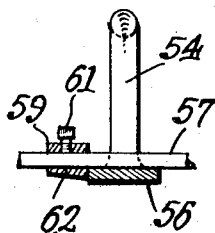
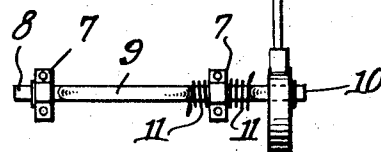
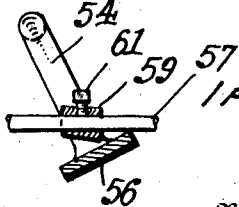


FIG. 6.



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DOOR OPERATOR

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3 Sheets-Sheet 3

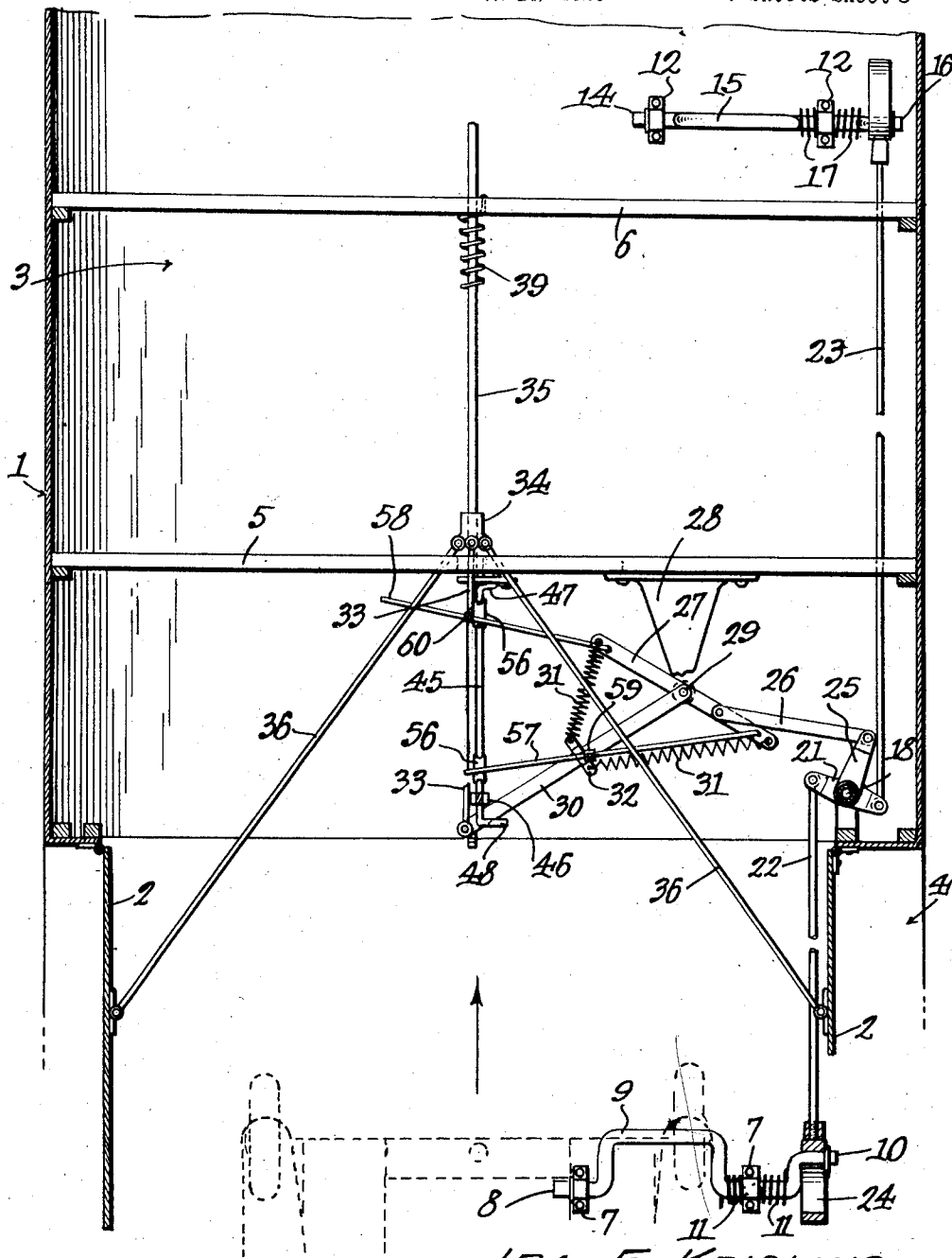


FIG. 7.

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UNITED STATES PATENT OFFICE.

IRA FRANKLIN KEISLING, OF KOKOMO, INDIANA.

DOOR OPERATOR.

Application filed August 16, 1926. Serial No. 129,559.

This invention aims to provide a simple but effective means whereby the doors of a garage or other building may be opened and closed by the movement of a vehicle, it being unnecessary for the driver of the vehicle to alight and open or close the doors.

It is within the province of the disclosure to improve generally and to enhance the utility of devices of that type to which the invention appertains.

With the above and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, may be made within the scope of what is claimed, without departing from the spirit of the invention.

In the drawings:—

Figure 1 shows in front elevation, a building wherein the device forming the subject matter of this application has been mounted;

Figure 2 is a perspective view showing a portion of the operating mechanism;

Figure 3 is an elevation showing the latch and attendant parts;

Figure 4 is a section on the line 4—4 of Figure 1, the doors being shut;

Figures 5 and 6 are elevations showing one of the cranks and one of the operating rods in different positions;

Figure 7 is a section on the line 4—4 of Figure 1, the doors being opened.

The numeral 1 marks a garage or other building, having horizontally swinging doors 2. The floor of the garage is marked by the numeral 3, and the runway, leading to the doors 2, is designated by the numeral 4. A forward support, in the form of a beam 5, extends across the upper portion of the garage 1. A rear support, in the form of a beam 6, extends across the upper portion of the garage 1.

Bearings 7 are located on the runway 4, and in the bearings, a horizontal shaft 8 is mounted to rock, the shaft 8 having a loop-shaped arm 9, and being provided with a crank 10. Torsion springs 11 are secured at their inner ends to the shaft 8, and at their outer ends to the runway 4, the function of the torsion springs being to hold the loop-shaped arm 9 normally in a vertical upstanding position.

Bearings 12 are mounted on the floor 3 of the garage 1. In the bearings 12, a shaft 14 is mounted to rock. The shaft has a loop-shaped arm 15 and is provided with a crank 16. Torsion springs 17 are connected at one end to the shaft 14, and at the other end to the floor of the garage. The torsion springs 17 hold the loop-shaped arm 15 normally in a vertical upstanding position.

A vertical shaft 18 is located near to one of the forward corners of the garage 1. The lower end of the shaft 18 is journaled in a bearing 19 in the floor 3, and the upper end of the shaft 18 is journaled in a bearing 20 on one of the side walls of a garage 1, as shown in Figure 1. Near to its lower end, the shaft 18 is supplied with a cross piece 21. The rear end of a forwardly extended link 22 is pivoted to one end of the cross piece 21. The forward end of a rearwardly extended link 23 is pivoted to the opposite end of the cross piece 21. In the forward end of the link 22 there is an elongated slot 24 receiving the crank 10 on the shaft 8. The rear end of the link 23 is connected in a similar way with the crank 16 of the shaft 14.

Near to its upper end, the shaft 18 has an arm 25. The arm 25 is pivoted to a link 26. The link 26 is pivoted to the intermediate portion of a lever 27. A bracket 28 is mounted on the support 5. A pivot element 29 connects the intermediate portion of the lever 27 with the bracket 28 and forms a fulcrum for the lever 27. On the pivot element 29, a radius arm 30 is mounted to swing. Retractable springs 31 are connected at one end to the extremities of the lever 27. Springs 31 converge, and are secured to the radius arm 30, intermediate the ends of the radius arm, by means of a yoke 32.

A rigid connection 33 is pivoted at its forward end to the inner end of the radius arm 30. The rear end of the connection 33 is pivoted to a foot piece 34 secured to a plunger 35. The plunger 35 is mounted for reciprocation in the supports 5 and 6. Operating rods 36 are pivoted at their rear ends to the foot piece 34. The forward ends of the operating rods 36 are pivoted to the doors 2. A compression spring 39 is secured to the support 6, and is located about the plunger 35. The spring 39 acts as a cushioning spring if the doors 2 are closed, and when the foot 34 moves rearwardly, along with the plunger 35, as shown in Fig-

ure 4. The plunger 35 has spaced seats 37 and 38, which are shown best in Figure 2 of the drawings.

A U-shaped latch 40 is fulcrumed intermediate its ends as at 41 on the support 5. A retractile spring 42 is connected to one end 43 of the latch 40 and to the support 5. The spring 42 causes the lower end 44 of the latch to contact with the plunger 35, and as the plunger is reciprocated, the end 44 of the latch will engage with one or the other of the seats 37 and 38.

A shaft 45 is journaled in the support 5 and in a bearing 46 carried by any accessible portion of the building 1. The shaft 45 has a crank arm 47 at its rear end. The crank arm 47 extends beneath the end 43 of the latch 40, and when the shaft 45 is rotated, the crank arm 47, cooperating with the end 43 of the latch 40, lifts the arm out of the seat 37 or the seat 38 in the plunger 35, thereby enabling the doors 2 to be closed or opened. There is a finger 48 at the forward end of the shaft 45. The finger 48 extends beneath a projection 49 on a rod 50 mounted to slide vertically in bearings 51 on one of the doors 2. There is a hole 52 in the said door 2, and this hole affords access to a handle 53 on the lower end of the rod 50, when the doors 2 are closed. The shaft 45 has eccentric portions 54 and 55. Each of the eccentric portions 54 and 55 has a flat base 56 of considerable width, as shown in Figures 5 and 6.

An actuating member 57, in the form of a rod, rests on the flat base 56 of the eccentric 54. The rod 57 is pivoted to the lever 27 at a point near to one end of the lever. An actuating member 58, in the form of a rod, rests on the flat base 56 of the eccentric 55. The rod 58 is pivoted to one end portion of the lever 27, the actuating members 57 and 58 being disposed on opposite sides of the fulcrum 29 of the lever 27. There is a projection or block 59 on the rod 57. There is a projection or block 60 on the rod 58. The projections 59 and 60 are held in adjusted positions on the respective rods 57 and 58 by set screws 61. Each of the projections 59 and 60 is beveled on its under surface, as shown at 62 in Figure 5.

When the automobile approaches the garage 1, the wheel of the automobile engages the arm 9 of the shaft 8 and imparts motion to the shaft 18, by way of the cross piece 21 and the link 22. At this point it may be stated that the slot 24 of the link 22 is duplicated in the link 23, and, consequently, when the device is operated by means of the arm 9 and the link 22, the link 23 can move with respect to the crank 16, without operating the shaft 14 and the arm 15.

When the shaft 18 is rotated, as aforesaid, the arm 25 operates the link 26, and the link 26 tilts the lever 27 on its fulcrum

29, the radius arm 30 swinging with the lever 27 to a certain extent, one of the springs 31 being put under tension. When the lever 27 swings as aforesaid, the projection 59 engages the base 56 of the eccentric portion 54 of the shaft 45 and rocks the shaft on its bearings. When the shaft 45 is rocked on its bearings, the crank arm 47 on the shaft 45 cooperates with the part 43 of the latch 40 and tilts the latch, so that the end 43 of the latch is out of engagement with the seat 37 in the plunger 35. The plunger 35 now moves forward, responsive to the action of the radius arm 30 and the spring 31 which has been put under tension, the rods 36 move forwardly, the doors are opened, and the part 34 of the latch engages in the seat 38 to hold the doors opened. As the wheel of the automobile moves over the arm 15, the doors are closed, the actuating member 58 then coming into play, in place of the actuating member 57. The automobile backs out of the garage, the doors are opened by means of the arm 15, and when the automobile is out of the garage, the doors are closed by means of the arm 9.

If the operator wishes to open the doors by hand, from the outside of the garage, he can do this by raising the rod 50 through the instrumentality of the handle 53, the part 49 of the rod 50 rocking the shaft 45 by way of the finger 48, and causing the crank arm 47 to disengage the latch 40 from the plunger 35.

Relative to the operation of the projection or latch 49 on the actuating member 57, a word or two may be added in conclusion, reference being had to Figures 5 and 6. When the actuating member 57 is advanced, the block 59 engages the base 57 of the eccentric 54 and operates the shaft 45 in a way hereinbefore set forth. Owing to the fact that the base 56 has considerable width, the base 56 raises the actuating member 57 after the eccentric 54 has tilted somewhat. This permits the eccentric member 54 to swing back into its original place, over the block 59. When the actuating member 57 moves backwardly, to assume the position shown in Figure 2, the block 59 slides over the top of the base 56 of the eccentric 54, because the block 59 is beveled as shown at 62. The beveling at 62 raises the actuating member or rod 57, as it moves backwardly over the part 56, and the eccentric 54 is not operated to impart rocking movement to the shaft 45. When the doors 2 are closed, and when the foot piece 34 moves backwardly, along with the plunger 35, the spring 39 acts as a cushioning spring, in a way which will be understood readily when Figure 4 of the drawings is examined.

What is claimed is:—

1. In a device of the class described, a movably mounted door, a plunger supported

for sliding movement, a connection between the door and the plunger, a lever and a fulcrum therefor, a radius arm mounted for swinging movement, a yieldable connection
5 between the lever and the radius arm, means for connecting the radius arm with the plunger, car-operated means for moving the lever, a latch engaging the plunger, a shaft supported for rocking movement and hav-
10 ing an eccentric portion, the shaft comprising a part which cooperates with the latch to disengage the latch from the plunger, an actuating member pivoted to the lever and slidable on the eccentric portion of the shaft,
15 the actuating member having a projection which cooperates with the eccentric portion

of the shaft to rock the shaft and to disengage the latch from the plunger.

2. A device of the class described, constructed as set forth in claim 1, and further
20 characterized by the fact that the base of the eccentric portion of the shaft is wide enough so that the base will raise the actuating member after the eccentric portion has tilted to a predetermined point, thereby to
25 permit the eccentric member to swing back to its original place, over the projection.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

IRA FRANKLIN KEISLING.