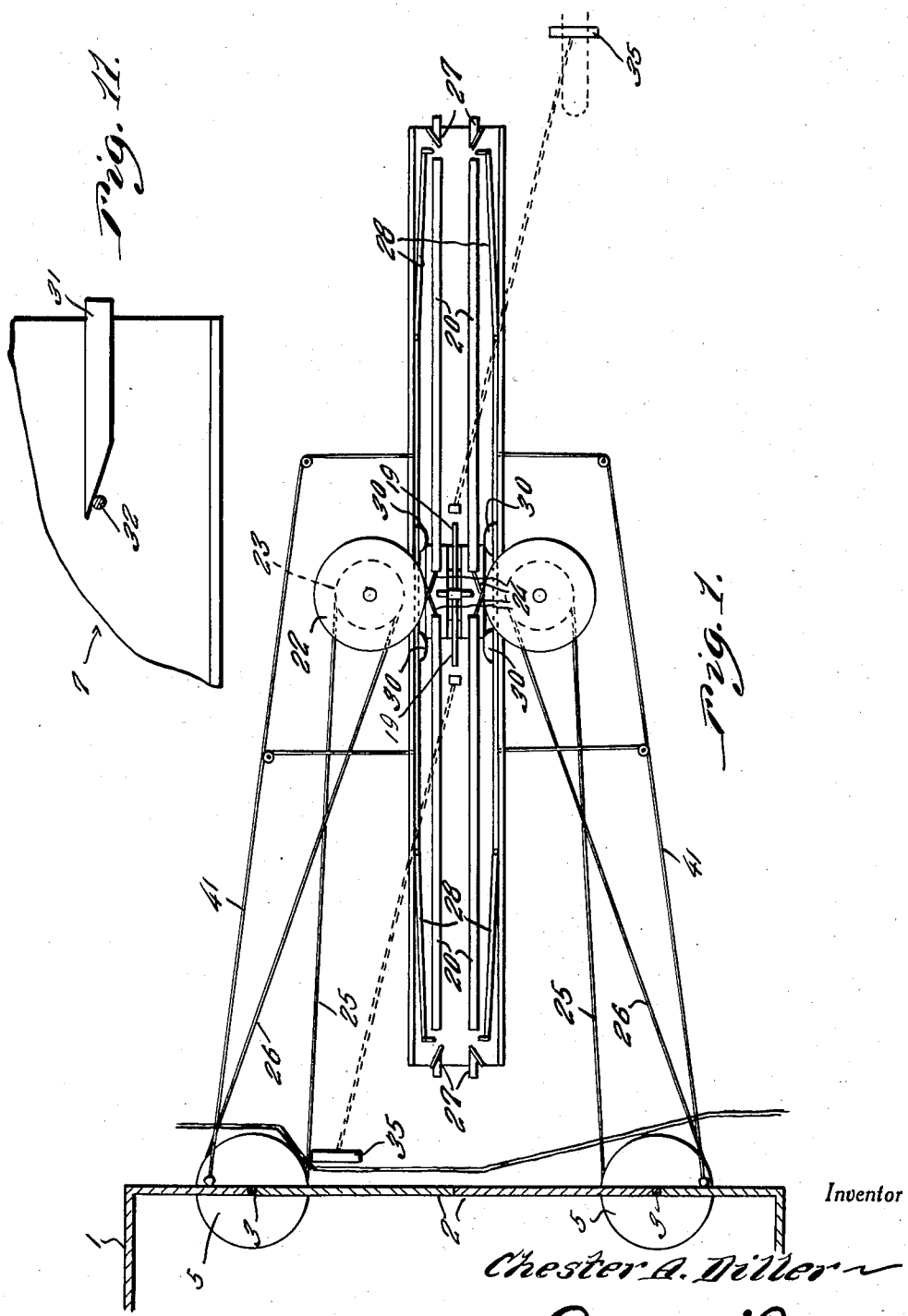
June 5, 1934. C. A. DILLER 1,961,283

GARAGE DOOR OPERATING MECHANISM

Filed Feb. 5, 1934 4 Sheets-Sheet 1



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GARAGE DOOR OPERATING MECHANISM

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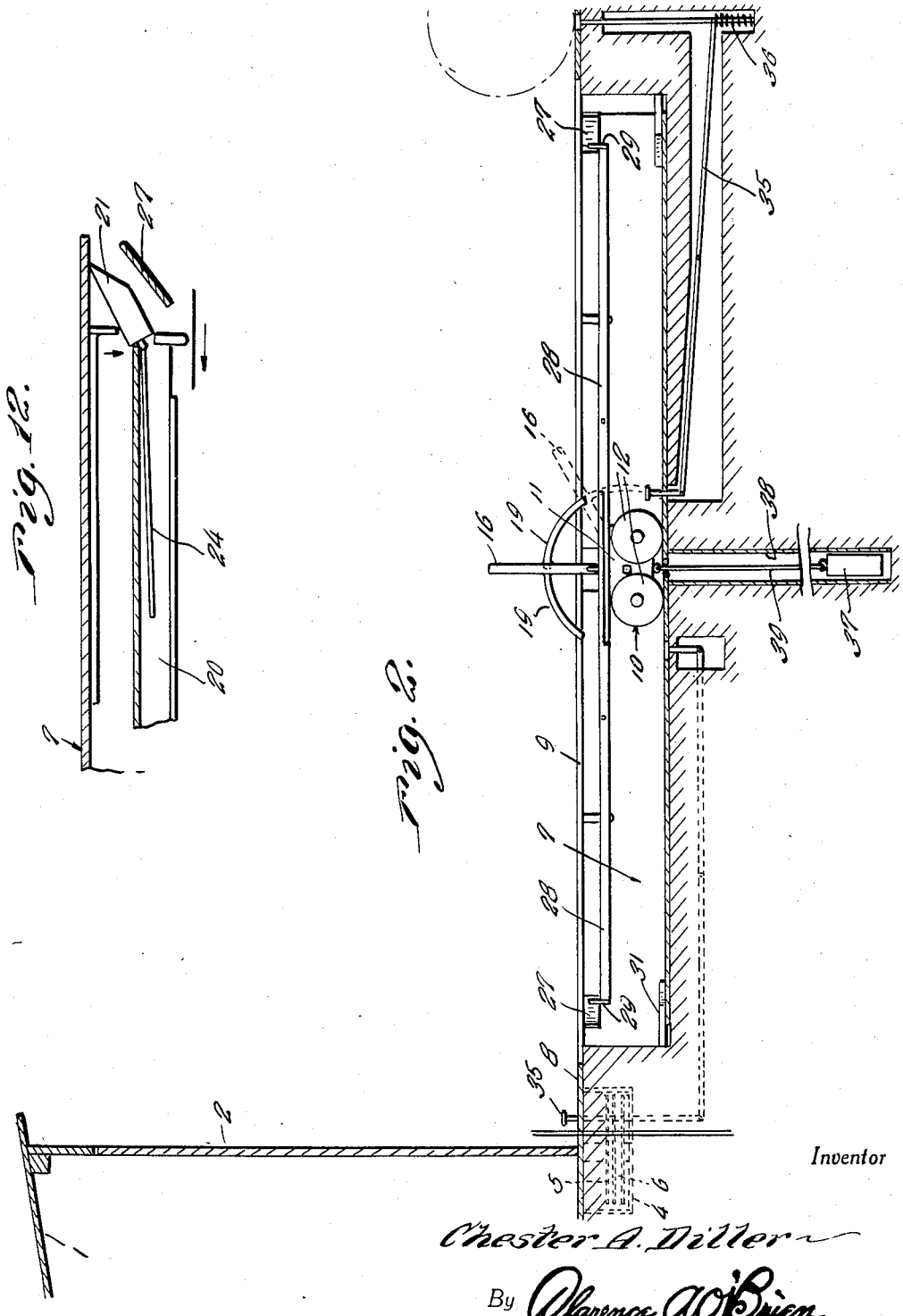


Fig. 2a.

Fig. 2.

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GARAGE DOOR OPERATING MECHANISM

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Fig. 8.

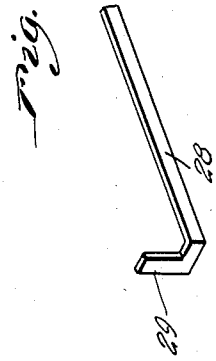


Fig. 9.

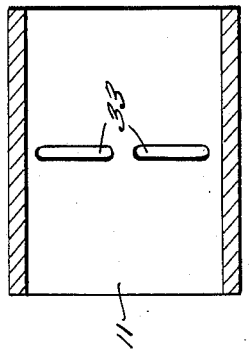


Fig. 10.

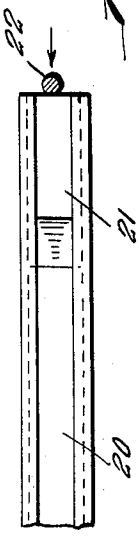


Fig. 4.

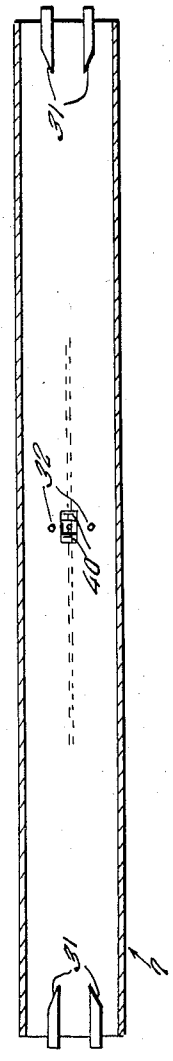
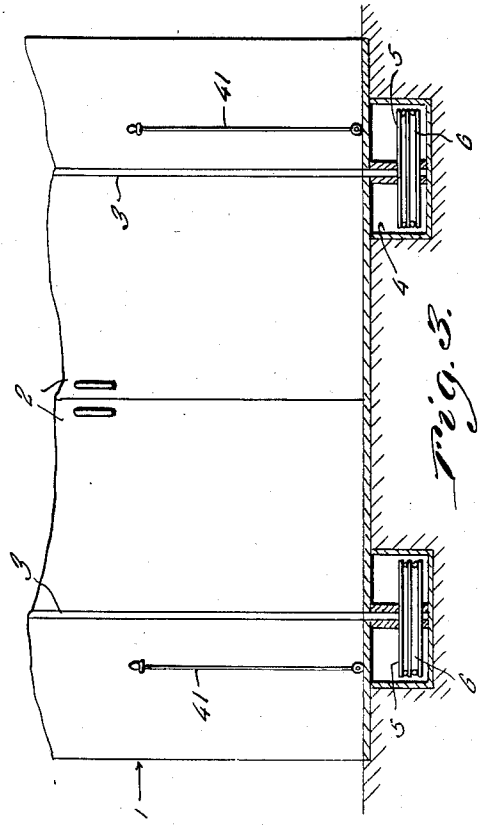


Fig. 5.



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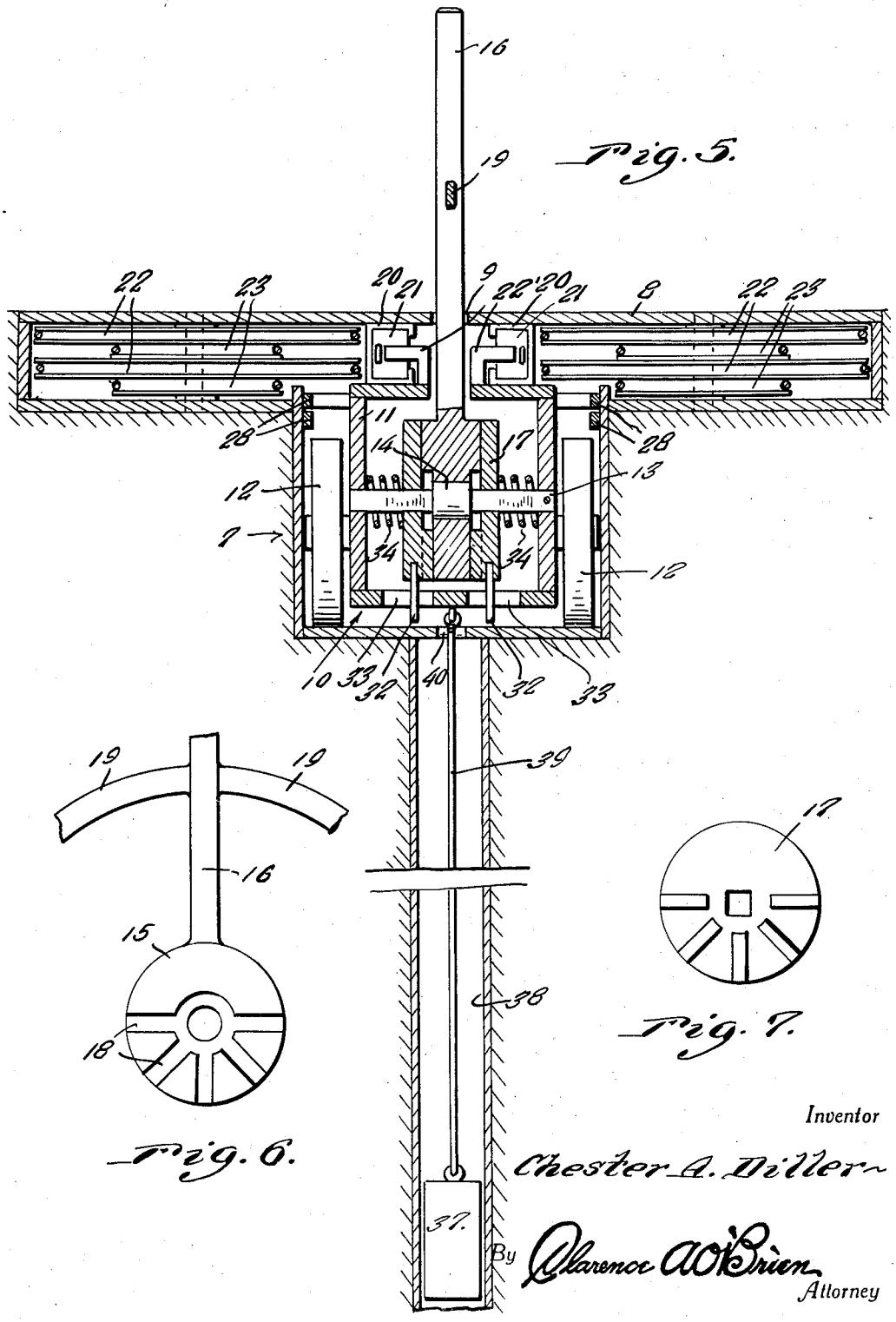


Fig. 5.

Fig. 6.

Fig. 7.

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GARAGE DOOR OPERATING MECHANISM

Chester A. Diller, Gap, Pa.

Application February 5, 1934, Serial No. 709,862

3 Claims. (Cl. 268—35)

The present invention relates to new and useful improvements in garage door operating mechanisms and has for its primary object to provide, in a manner as hereinafter set forth, a mechanism of this character embodying a novel construction, combination and arrangement of parts through the medium of which said mechanism may be actuated by an automobile approaching or leaving the garage for opening or closing the doors.

Other objects of the invention are to provide a garage door operating mechanism of the aforementioned character which will be comparatively simple in construction, strong, durable, highly efficient and reliable in operation, compact and which may be manufactured and installed at low cost.

All of the foregoing and still further objects and advantages of the invention will become apparent from a study of the following specification, taken in connection with the accompanying drawings wherein like characters of reference designate corresponding parts throughout the several views, and wherein:—

Figure 1 is a view in top plan of the invention with the cover removed, showing a portion of the garage and the doors in horizontal section.

Figure 2 is a view in vertical longitudinal section through the mechanism.

Figure 3 is a view in front elevation of the lower portion of the garage, showing the adjacent portion of the mechanism constituting the present invention in vertical transverse section.

Figure 4 is a view in horizontal section through the runway.

Figure 5 is a view in vertical transverse section, taken substantially through the center of the mechanism.

Figure 6 is a detail view in side elevation of the swingable standard which rises from the carriage.

Figure 7 is a detail view in elevation of one of the clutch members.

Figure 8 is a detail view in perspective of one end portion of one of the block disengaging levers.

Figure 9 is a detail view in horizontal section through the carriage frame.

Figure 10 is a detail view in side elevation, showing one end portion of one of the substantially C-shaped tracks.

Figure 11 is a fragmentary view in top plan of a portion of the runway.

Figure 12 is a view in horizontal section through an end portion of the runway and one of the tracks, showing the means for locking the blocks which travel in said tracks.

Referring now to the drawings in detail, it will be seen that the reference numeral 1 designates generally a garage of conventional construction which is provided with a pair of swinging doors 2. In the embodiment of the present invention which has been illustrated, the doors 2 are fixed on vertical rotary shafts 3 which extend below the floor of the garage into housings 4. Fixed on the lower end portion of each shaft 3, in the respective housings 4, is a pair of grooved drums 5 and 6.

Extending longitudinally in front of the garage is a sunken runway which is designated generally by the reference numeral 7. The runway 7 is closed by a cover 8 having a longitudinal slot 9 therein. Operable in the runway 7 is a carriage which is designated generally by the reference numeral 10, said carriage including a frame 11 which is mounted on supporting wheels 12. Fixed transversely in the frame 11 is a polygonal shaft 13 having a bearing 14 at an intermediate point upon which the hub portion 15 of a standard 16 is journaled, said standard 16 being operable in the slot 9. Slidably mounted on the shaft 13 are spring actuated clutches 17 which are operatively engageable with the opposite faces of the hub portion 15 for releasably locking the standard 16 against swinging movement on the bearing 14. The hub portion 15 of the standard 16 is provided with radial grooves 18 (see Figure 6) for the reception of the teeth of the clutches. Arcuate arms 19 project in opposite directions from an intermediate portion of the standard 16.

Mounted longitudinally beneath the cover 8 of the runway 7, on opposite sides of the slot 9, are pairs of opposed, substantially C-shaped tracks 20 beneath which the carriage 10 travels, said tracks thus constituting guides for the carriage. Slidably mounted in the tracks 20 are pairs of blocks 21 which are engageable by angular arms 22 which rise from the frame 11 of the carriage 10 for actuation by said carriage. Attention is here invited to the fact that two pairs of tracks 20 are provided, the inner ends of which are spaced from each other, as illustrated to advantage in Figures 1 and 2 of the drawings. The blocks 21 are mounted in each of the four tracks 20.

Mounted beneath the cover 8, adjacent the inner ends of the pairs of tracks 20, are pairs of large and small drums 22 and 23, respectively, two large drums 22 being provided on each side of the runway 7 and each of said large drums hav-

ing fixed therebeneath one of the small drums 23. Cables 24 have one end secured to the blocks 21 and their other ends anchored to the large drums 22 for winding thereon. The cables 24 which are attached to the uppermost large drums 22 are connected to the blocks 21 which are closest to the garage 1 and the cables 24 which are windable on the lowermost large drums 22 are connected to the blocks 21 which travel in the outer pair of tracks 20. The reference numeral 25 designates a pair of door opening cables having one end secured to the uppermost small drums 23 for winding thereon and their other ends secured to the upper drums 5 on the door shafts 3 for winding thereon. The reference numeral 26 designates a pair of door closing cables which cross the cables 25 and have one end secured to the lowermost small drums 23 and their other ends secured to the drums 6 for winding thereon.

Mounted in the end portions of the runway 7 are pairs of deflectors 27 which are adapted to assist in engaging the blocks 21 in locked position with the outer ends of the tracks 20, as illustrated to advantage in Figure 12 of the drawings. Pivotally mounted in the runway 7 are horizontally swinging releasing levers 28 having angular outer end portions 29 (see Figure 8) which are engageable with the blocks 21 for disengaging said blocks from the ends of the tracks 20. The releasing levers 28 are provided in pairs, one for each block 21, between which the carriage 7 travels. The levers 28 project beyond the inner ends of the adjacent tracks 20 (see Figure 1) and are provided on their inner ends with cams 30 for engagement by the carriage 10.

Pairs of cams 31 are also provided in the end portions of the runway 7 for engagement with pins 32 for disengaging the clutch members 17, thereby releasing the standard 16 when the carriage 10 approaches the limit of its travel in either direction in the runway 7. The pins 32 are operable in slots 33 which are provided therefor in the bottom of the carriage frame 11. The reference numeral 34 designates the coil springs which yieldingly urge the clutches 17 toward engaged or operative position. The reference numeral 35 designates a pair of vehicle actuated trips which are engageable with the free ends of the arms 19 for swinging the standard 16 to an upright position. The trips 35 are returned to inoperative position by springs 36, the operating end of one of said trips being located adjacent the garage, the operating end of the other of said trips being located beyond the outer end of the runway 7. This is best seen in Figure 1 of the drawings.

The carriage 10 is returned by gravity to inoperative position through the medium of a weight 37 which is operable in a well 38 which is provided therefor and which communicates with the runway 7. The weight 37 is connected to the bottom of the carriage frame 11 by a cable 39 which travels over anti-friction rollers 40 in the bottom of the runway 7. The reference numeral 41 designates cables which are connected to the levers 28 for manually disengaging the blocks 21 from the ends of the tracks 20 to permit either or both of the garage doors to be manually opened. Briefly, the operation of the apparatus is as follows:—

With the standard 16 in the position indicated in broken lines in Figure 2 of the drawings, the automobile approaching the garage is driven over the outer trip 35 for swinging said standard to an upright position where it is arrested and locked by the clutches 17 when the teeth thereof seat in the channels 18. With the standard 16 in this position said standard is engaged by the automobile and the carriage 10 is then moved in the runway 7 toward the garage. Movement of the carriage in this direction, of course, slides the pair of blocks 21 which are closest to the garage in a corresponding direction in their respective tracks 20, thus actuating the cables 25 for swinging the garage doors open. As hereinbefore stated, the blocks are moved in this manner by the angular arms 22 on the carriage frame 11. As these blocks reach the ends of their respective tracks which are adjacent the garage they are engaged with said tracks substantially in the manner shown in Figure 12 of the drawings for locking the doors in open position. Substantially at the same time, the cams 31 engage the pins 32 and spread the clutches 17 to open position, thereby releasing the standard 16, permitting said standard 16 to swing downwardly toward the garage for permitting the passage of the automobile. The carriage 10 is then returned to its former position, shown in Figures 1 and 2 of the drawings, by the weight 37. As the carriage 10 reaches its former or inoperative position, said carriage engages the cams 30 of the inner pair of levers 28, actuating the same in a manner to disengage the blocks 21 which are locked to the ends of their respective tracks which are adjacent the garage. The garage doors 2 may then be closed. If desired, any suitable mechanical means may be provided for closing the doors when they are thus released. When the automobile leaves the garage, the doors 2 are swung to open position and said automobile is driven over the innermost trip 35 for again swinging the standard 16 to an upright position where it is locked by the clutches 17. The automobile traveling outwardly from the garage, then engages the standard 16 and carries the carriage 10 outwardly therewith in the runway 7. When the carriage 10 is moved in this direction the blocks 21 in the outer pair of tracks 20 are engaged by the angular arms 22 and moved outwardly, thus actuating the cables 26 in a manner to close the garage doors after the automobile has been driven from the garage. These outermost blocks 21 are carried outwardly and engaged with the outer ends of their respective tracks 20 and the cams 31 in the outer end portion of the runway 7 engage the pins 32 for disengaging the clutches 17, thereby permitting the standard 16 to be swung downwardly to permit the passage thereover of the automobile. The weight 37 again returns the carriage 10 to inoperative position where it engages the cams 30 on the outermost pair of levers 28 for releasing the locked blocks 21 and permitting closing of the doors. If desired, a mechanism substantially similar to that hereinbefore described may be installed inside of the garage, particularly if it be a large garage, for permitting the doors to be closed behind the vehicle after it has entered and for opening the doors as the vehicle approaches the same when leaving the garage.

It is believed that the many advantages of a garage door operating mechanism constructed in accordance with the present invention will be readily understood, and although a preferred embodiment of the invention is as illustrated and described, it is to be understood that changes in the details of construction and in the combination and arrangement of parts may be resorted to which will fall within the scope of the invention as claimed.

What is claimed is:—

1. A mechanism of the class described for operating garage doors comprising a runway, drums mounted adjacent the runway, tracks mounted in the runway, blocks slidable in the tracks, a carriage operable in the runway, means operatively connecting the blocks to the carriage for actuation thereby, means operatively connecting the drums to the blocks for actuation thereby, means operatively connecting the doors to the drums for actuation thereby, means for engaging the blocks with the ends of their respective tracks for locking the doors, and means for operatively connecting the carriage to a passing vehicle for actuation thereby.

2. A mechanism of the class described for operating garage doors comprising a runway, drums mounted adjacent the runway, tracks mounted in the runway, blocks slidable in the tracks, a carriage operable in the runway, means operatively connecting the blocks to the carriage for actuation thereby, means operatively connecting the drums to the blocks for actuation thereby, means operatively connecting the doors to the drums for actuation thereby, means for engaging the blocks with the ends of their respective tracks for locking the doors, and means for operatively connecting the carriage to a passing vehicle for actuation thereby, the last-named means including a standard mounted for swinging movement on the carriage, clutch members mounted on the carriage for releasably locking the standard in an upright position against movement, cams in the runway for disengaging the clutches, arms projecting from the standard, and vehicle actuated trips operatively engageable with the arms for swinging the standard to an upright position when the clutches are disengaged.

3. A vehicle operated mechanism for actuating garage doors comprising a runway, a plurality of drums mounted adjacent the runway, tracks mounted in the runway, blocks slidable in the tracks, means operatively connecting the drums to the blocks for actuation thereby, means operatively connecting the doors to the drums for actuation thereby, a wheeled carriage operable in the runway, means operatively connecting the blocks to the carriage for actuation thereby, means operatively connecting the carriage to a passing vehicle for actuation thereby, means for locking the blocks in engagement with the tracks for securing the doors against swinging movement, means for returning the carriage to inoperative position, and means operable by the carriage for unlocking the blocks when the carriage returns to inoperative position.

CHESTER A. DILLER.