Sept. 4, 1928. 1,683,492

C. W. RUTH

MULTISTORY GARAGE

Filed May 14, 1923 25 Sheets-Sheet 1

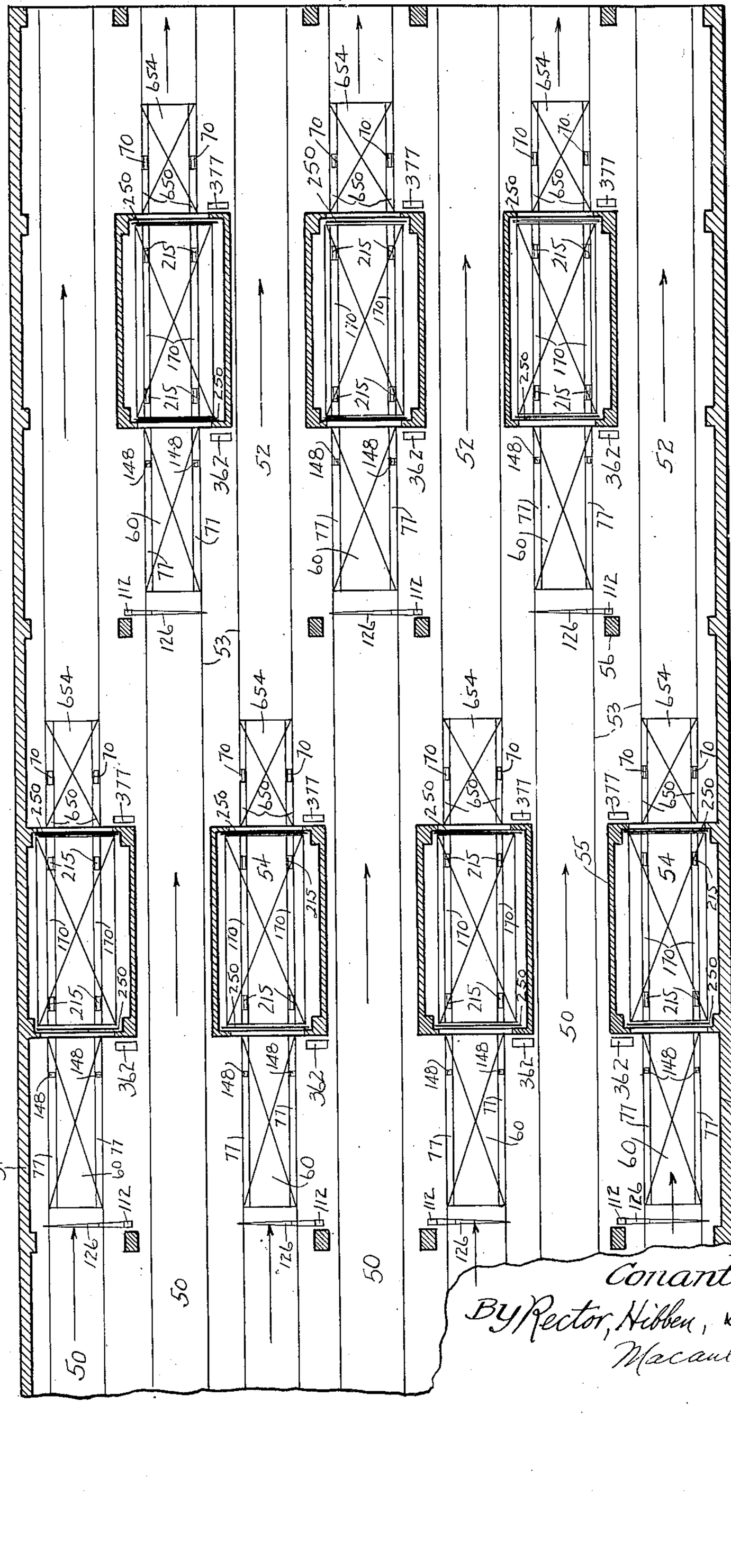

Fig. 1.

Inventor:
Conant W. Ruth,
By Rector, Hibben, Davis and
Macauley, Attys.

Sept. 4, 1928.

1,683,492

C. W. RUTH

MULTISTORY GARAGE

Filed May 14, 1923

25 Sheets-Sheet 2

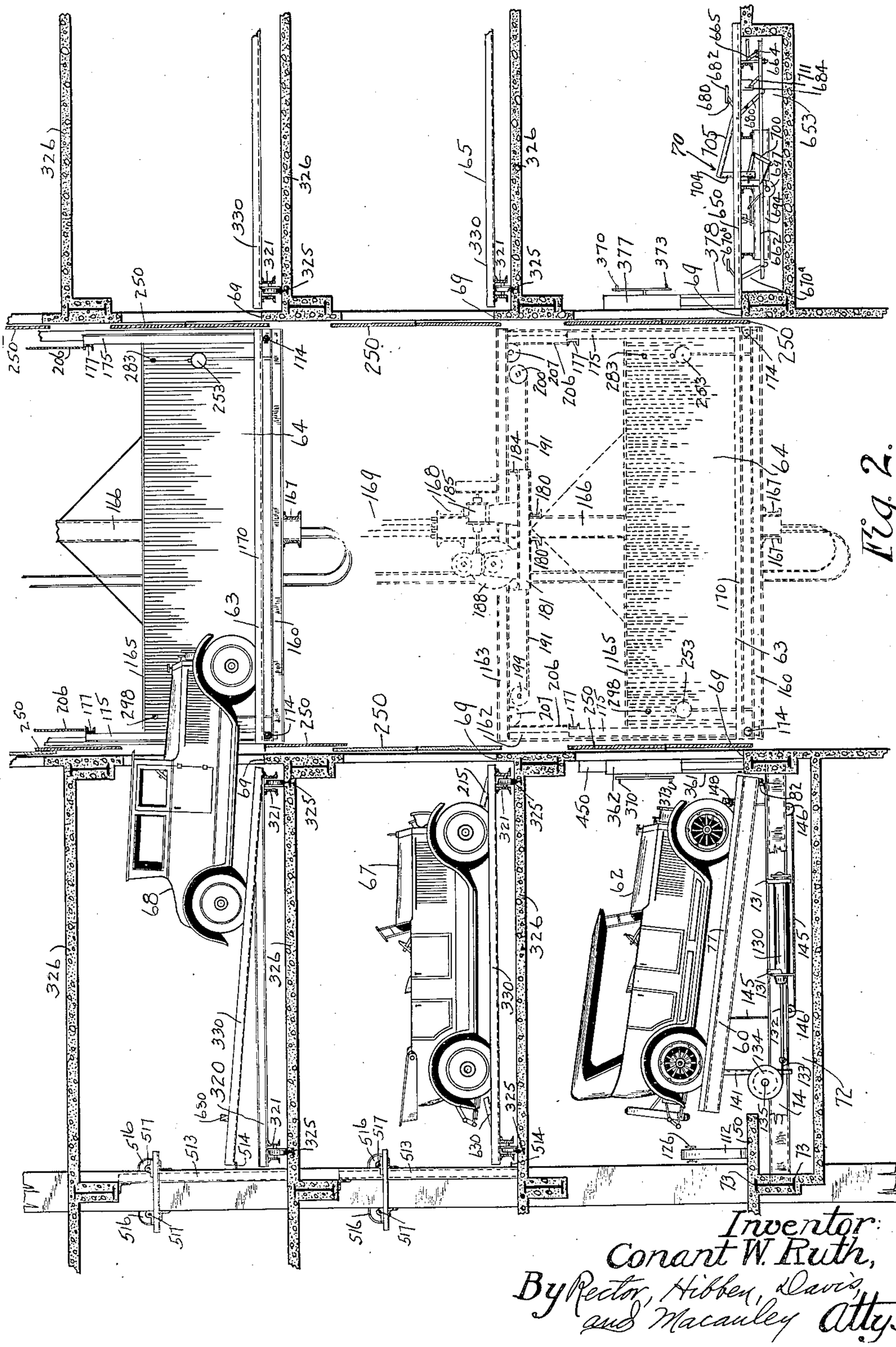

Fig. 2.

Inventor:
Conant W. Ruth,
By Rector, Hibben, Davis,
and Macauley Attys.

Sept. 4, 1928.

1,683,492

C. W. RUTH

MULTISTORY GARAGE

Filed May 14, 1923

25 Sheets-Sheet 3

Fig. 3.

Inventor;
Conant W. Ruth,
By Rector, Hibben, Davis
and Macauley, Attys.

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C. W. RUTH

MULTISTORY GARAGE

Filed May 14, 1923 25 Sheets-Sheet 4

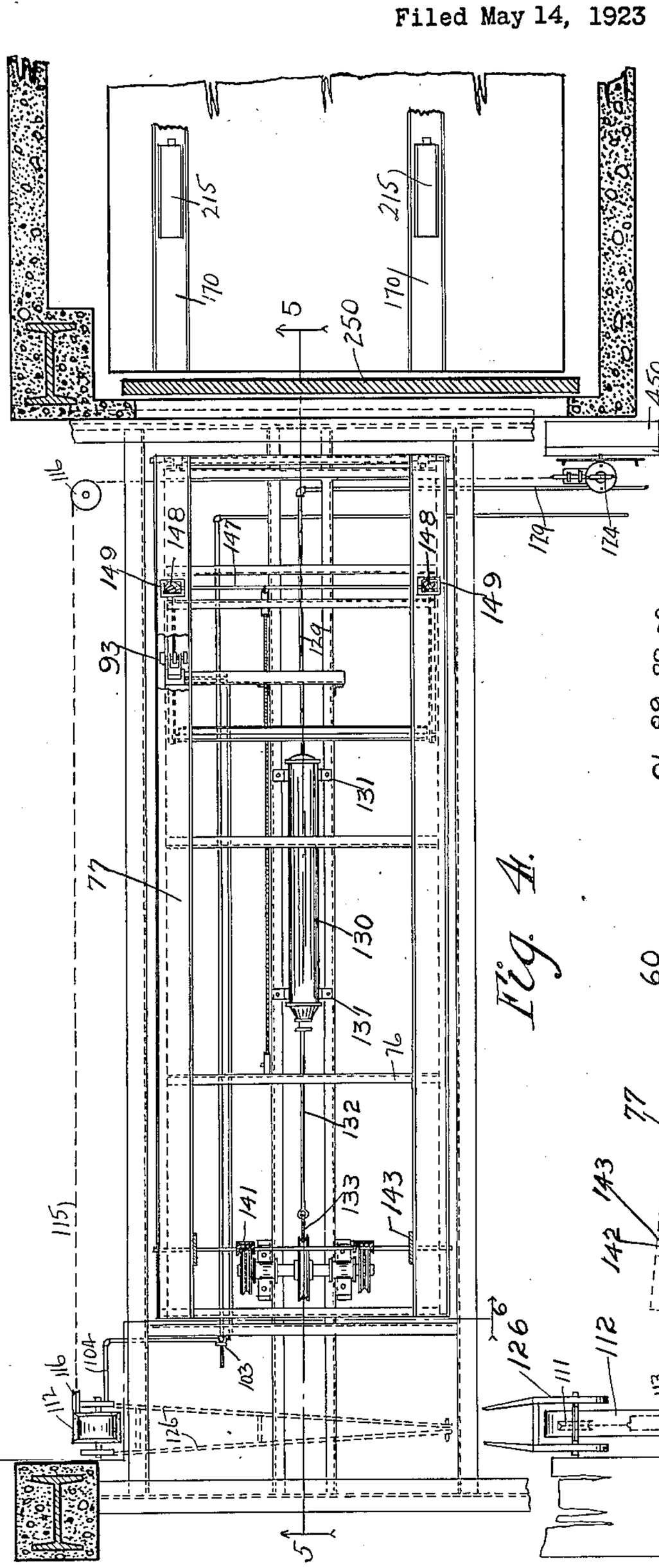

Fig. 4.

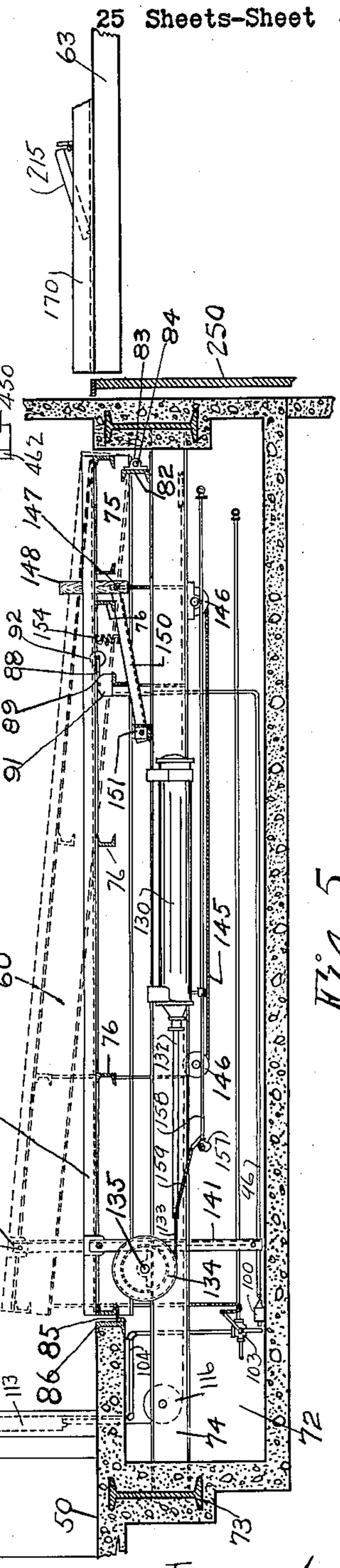

Fig. 5.

Inventor:
Conant W. Ruth,
By Rector, Hibben, Davis,
and Macauley, Attys.

Sept. 4, 1928. 1,683,492

C. W. RUTH

MULTISTORY GARAGE

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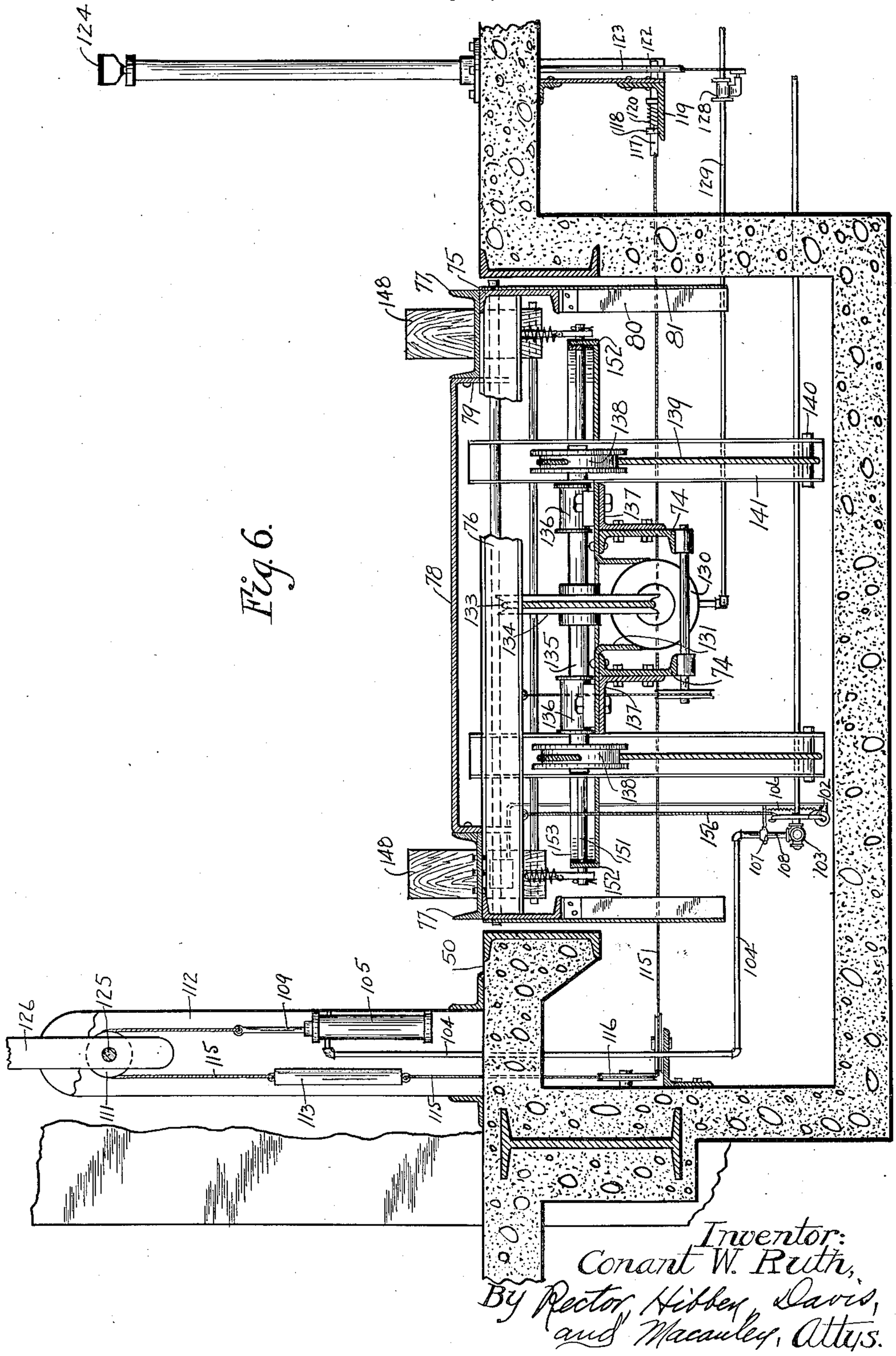

Fig. 6.

Inventor:
Conant W. Ruth,
By Rector, Hibben, Davis,
and Macauley, Attys.

Sept. 4, 1928.

1,683,492

C. W. RUTH

MULTISTORY GARAGE

Filed May 14, 1923

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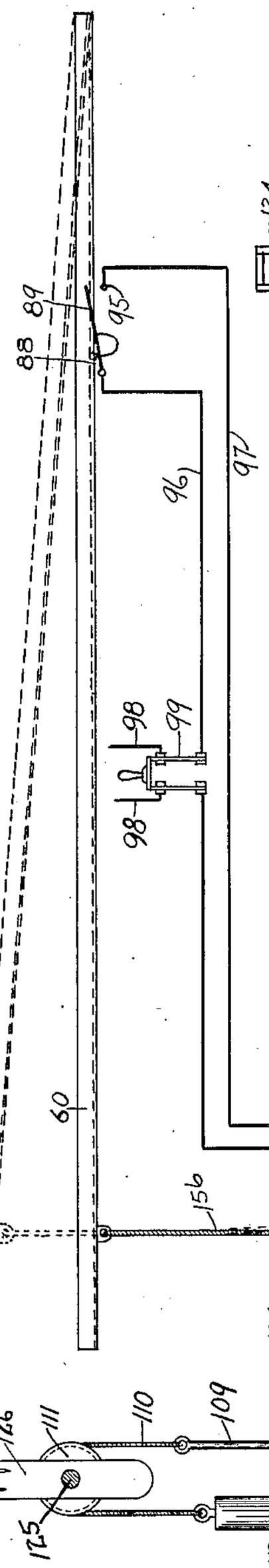

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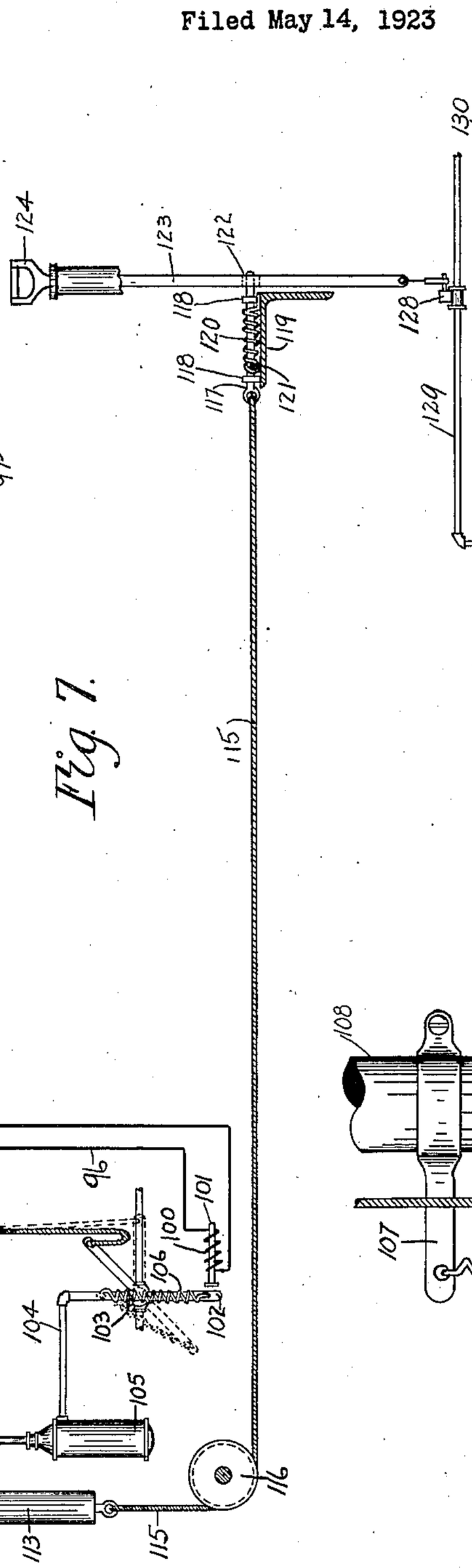

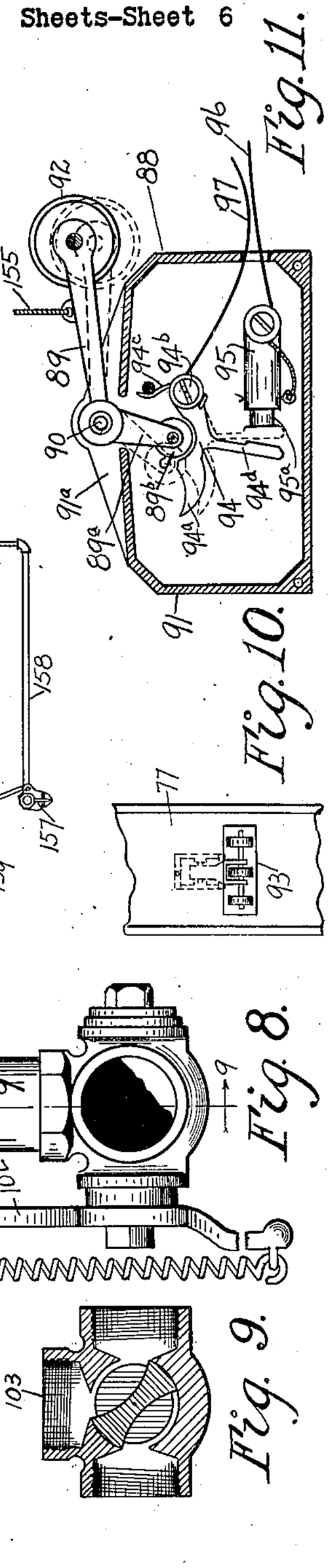

Fig. 10.

Fig. 11.

Fig. 8.

Fig. 9.

Inventor:
Conant W. Ruth,
By Rector, Hibben, Davis,
and Macauley, Attys.

Sept. 4, 1928. 1,683,492

C. W. RUTH

MULTISTORY GARAGE

Filed May 14, 1923 25 Sheets-Sheet 7

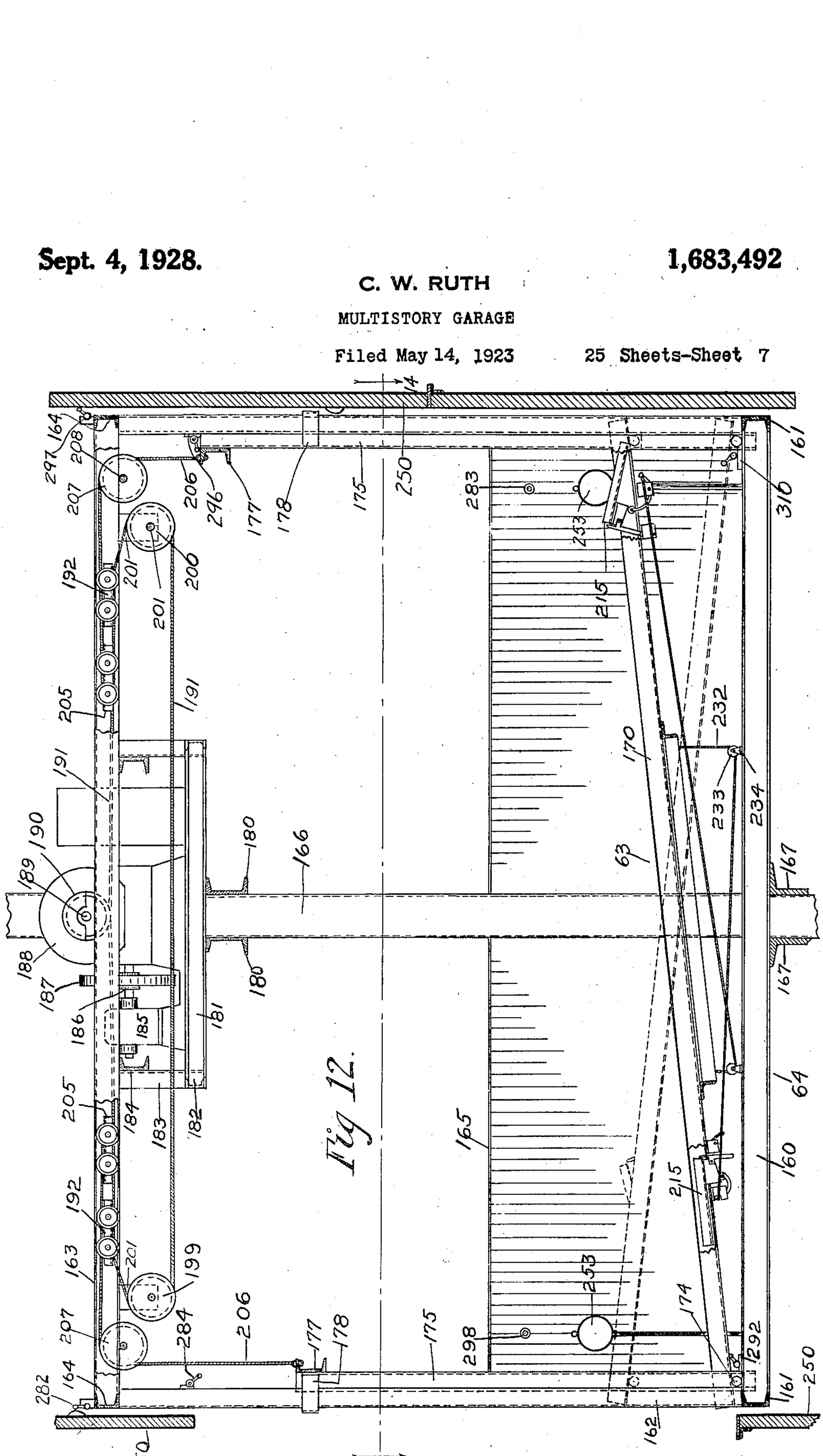

Fig 12.

Inventor
Conant W. Ruth,
By Rector, Hibben, Davis,
and Macauley, attys.

Sept. 4, 1928. 1,683,492

C. W. RUTH

MULTISTORY GARAGE

Filed May 14, 1923 25 Sheets-Sheet 8

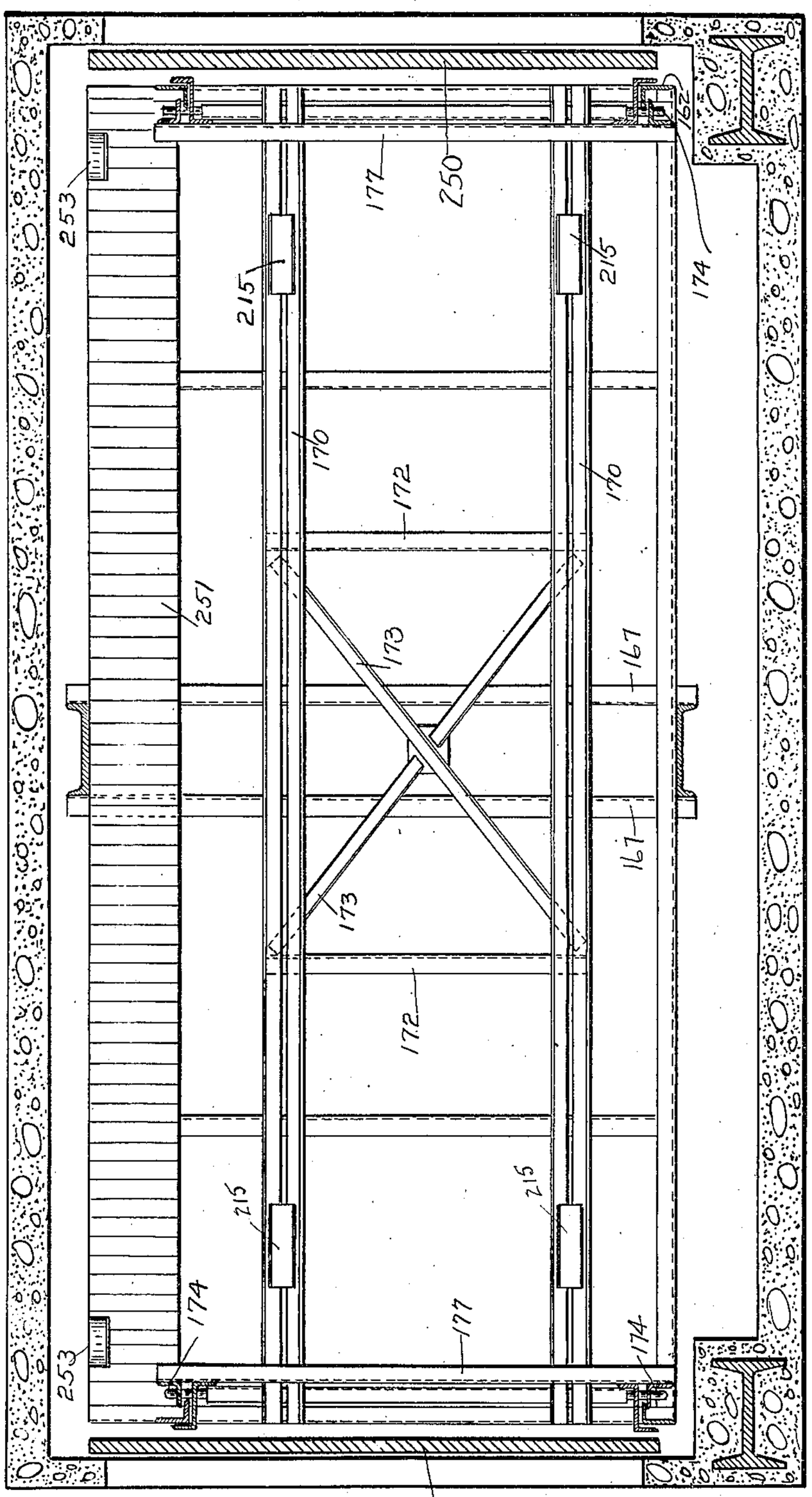

Fig. 13.

Fig. 14.

Inventor:
Conant W. Ruth,
By Rector, Hibben, Davis,
and Macauley, Attys.

Sept. 4, 1928. 1,683,492

C. W. RUTH

MULTISTORY GARAGE

Filed May 14, 1923 25 Sheets-Sheet 9

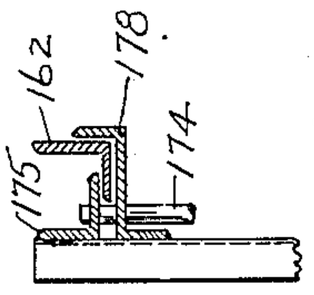

Fig. 16.

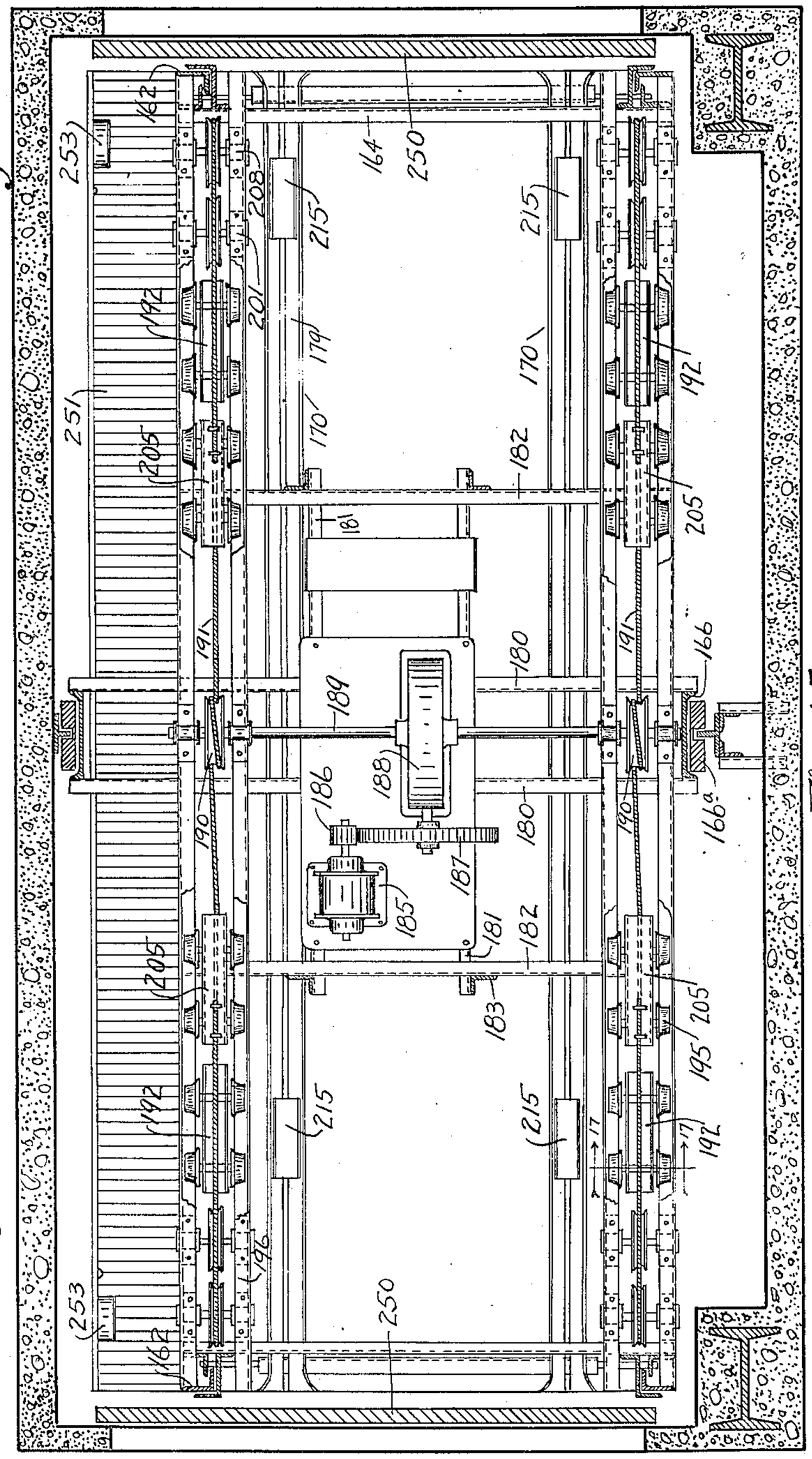

Fig. 15.

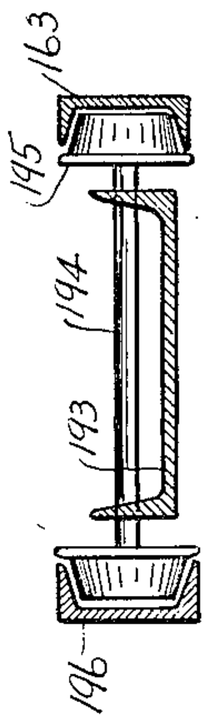

Fig. 17.

Inventor:
Conant W. Ruth,
By Rector, Hibben, Davis,
and Macauley, Attys.

Sept. 4, 1928. 1,683,492

C. W. RUTH

MULTISTORY GARAGE

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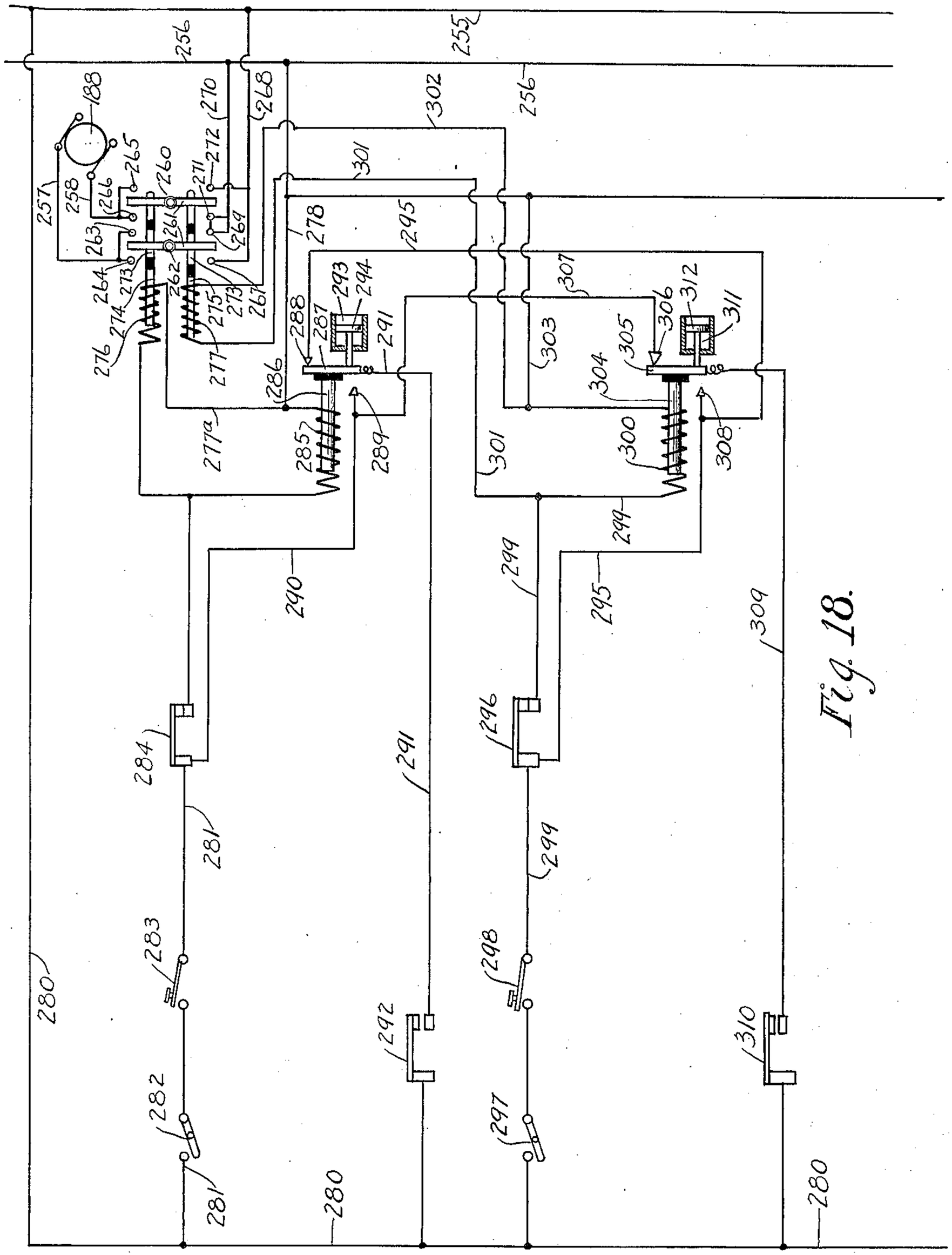


Fig. 18.

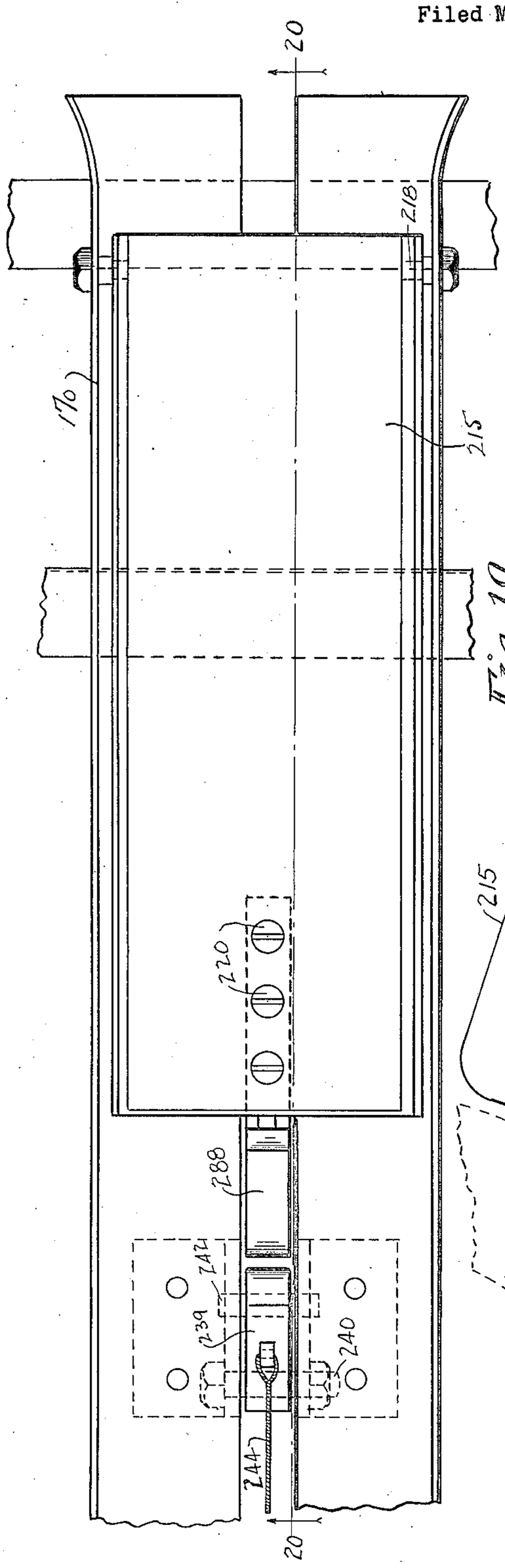
Inventor:
Conant W. Ruth,
By Rector, Hibben, Davis,
and Macauley, Attys.

Sept. 4, 1928. 1,683,492

C. W. RUTH

MULTISTORY GARAGE

Filed May 14, 1923 25 Sheets-Sheet 11



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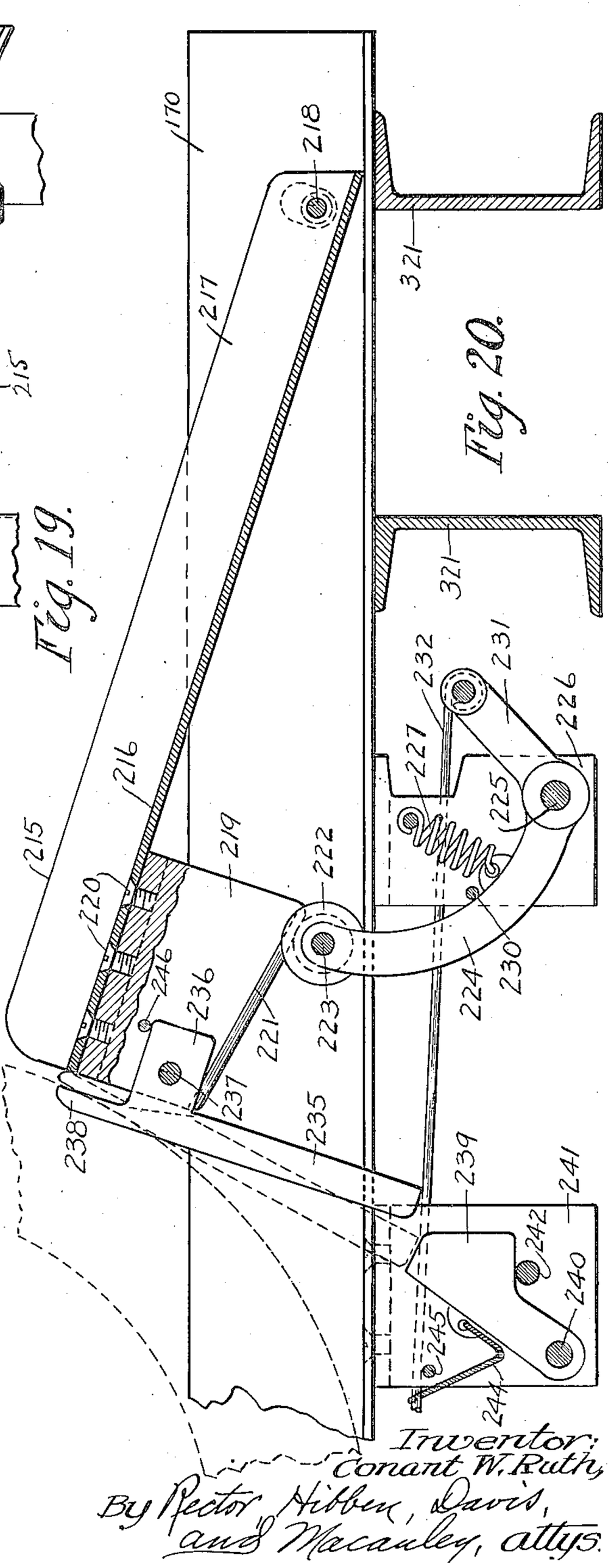


Fig. 20.

Inventor:
Conant W. Ruth,
By Rector, Hibben, Davis,
and Macauley, attys.

Sept. 4, 1928. 1,683,492

C. W. RUTH

MULTISTORY GARAGE

Filed May 14, 1923 25 Sheets-Sheet 12

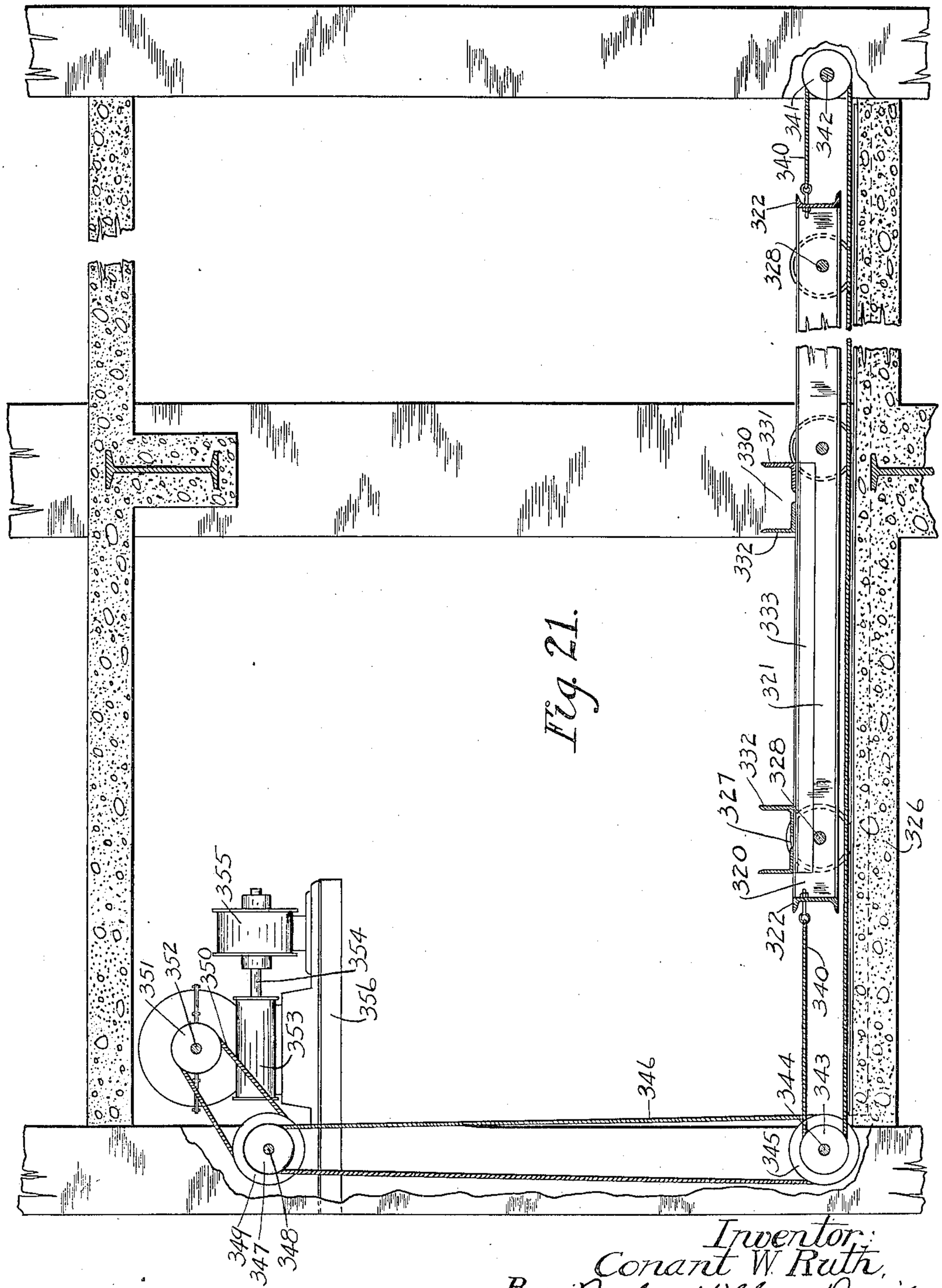


Fig. 21.

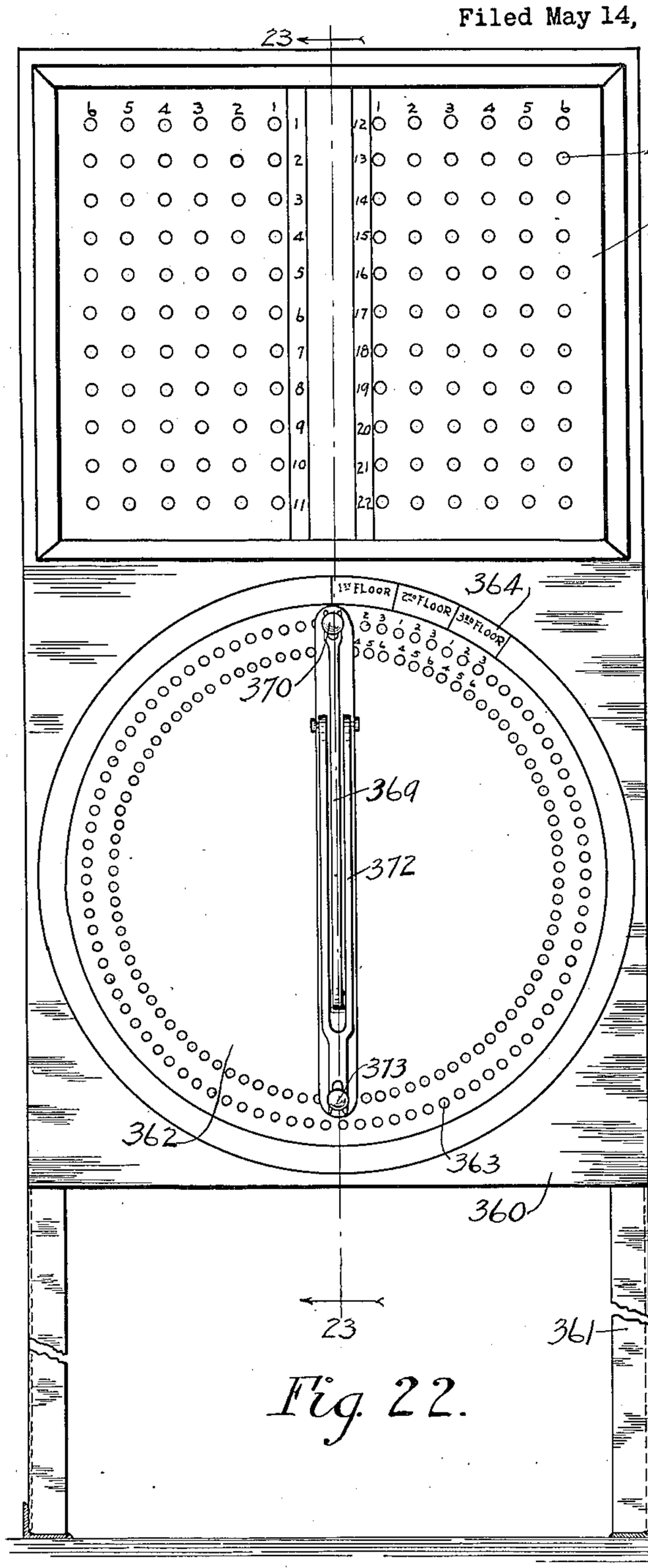
Inventor:
Conant W. Ruth,
By Rector, Hibben, Davis,
and Macauley, Attys.

Sept. 4, 1928. 1,683,492

C. W. RUTH

MULTISTORY GARAGE

Filed May 14, 1923 25 Sheets-Sheet 13



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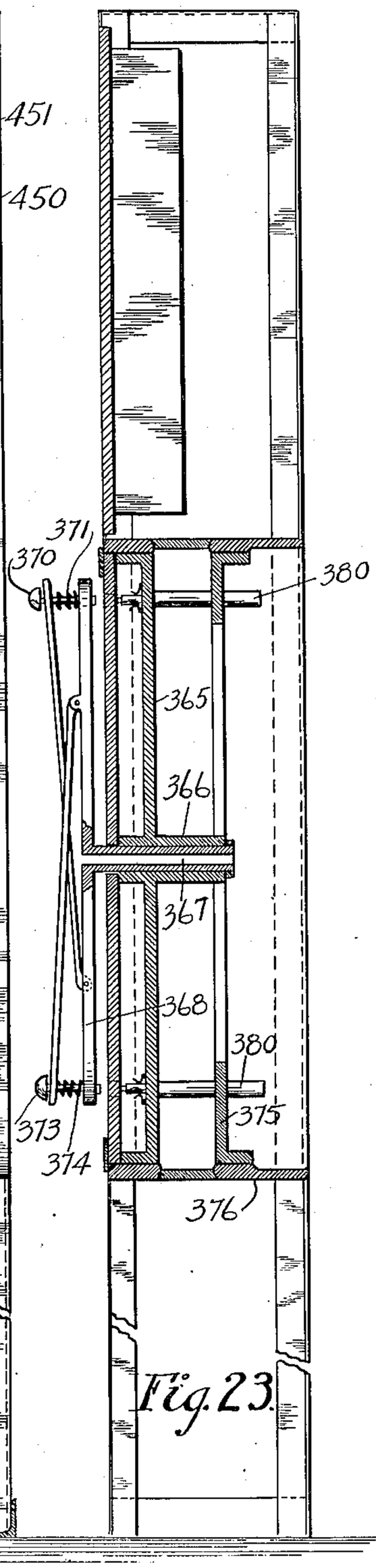

Fig. 23.

Inventor:
Conant W. Ruth,
By Rector, Hibben, Davis
and Macauley, Attys.

Sept. 4, 1928. 1,683,492

C. W. RUTH

MULTISTORY GARAGE

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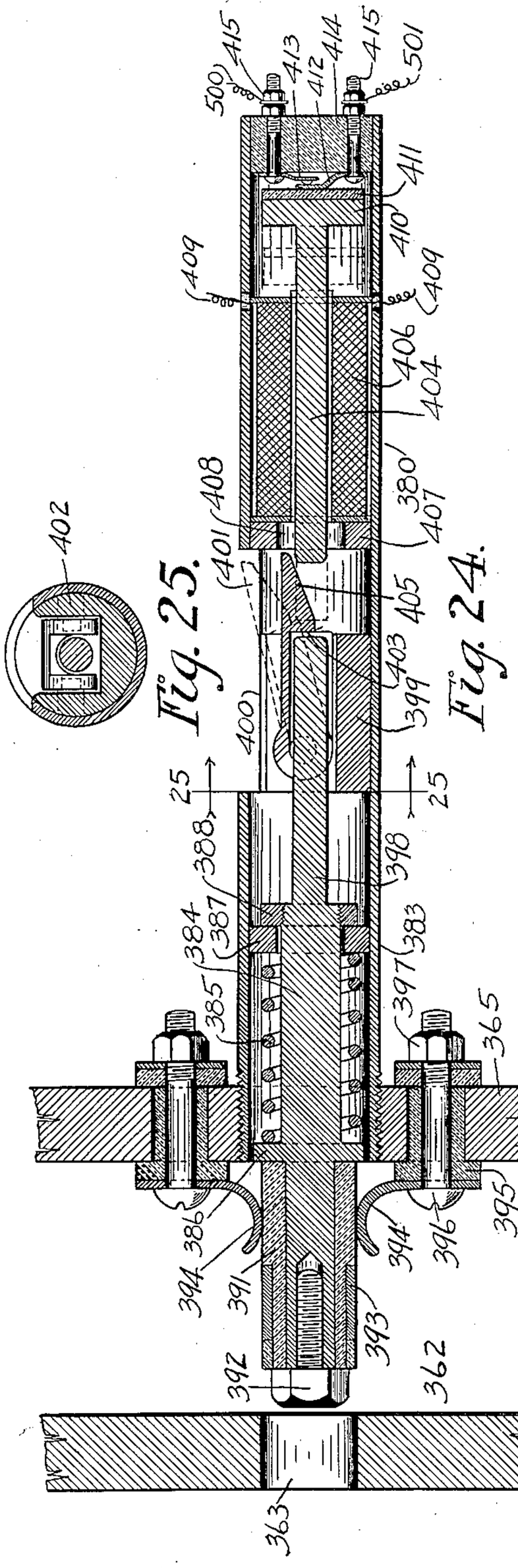


Fig. 25.

Fig. 24.

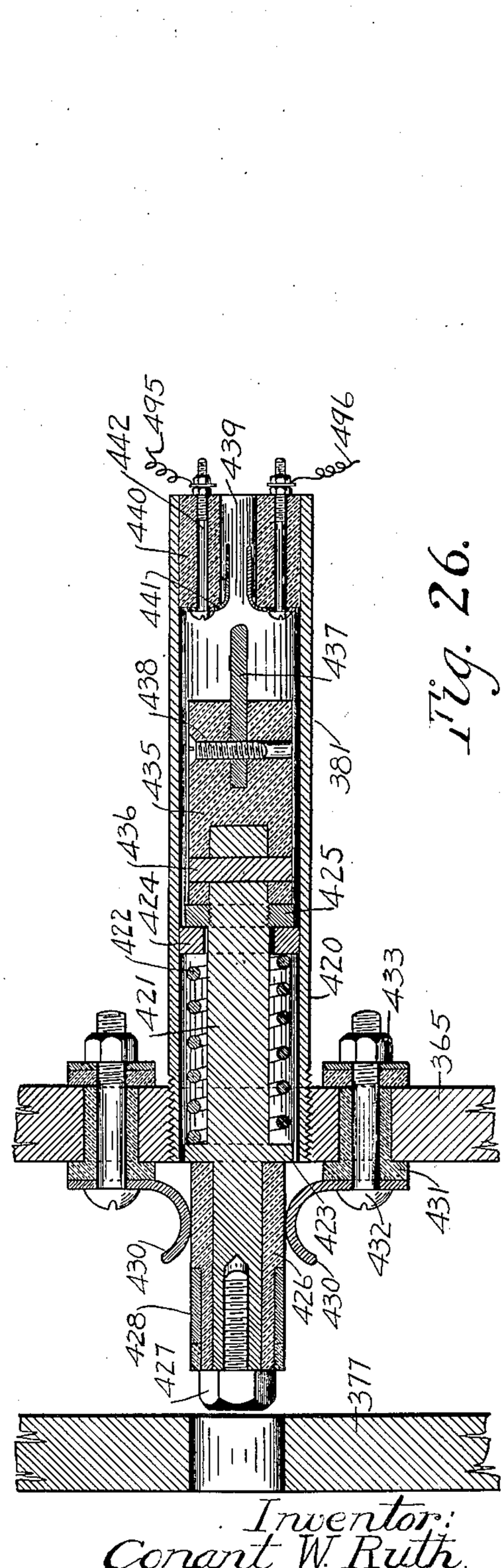


Fig. 26.

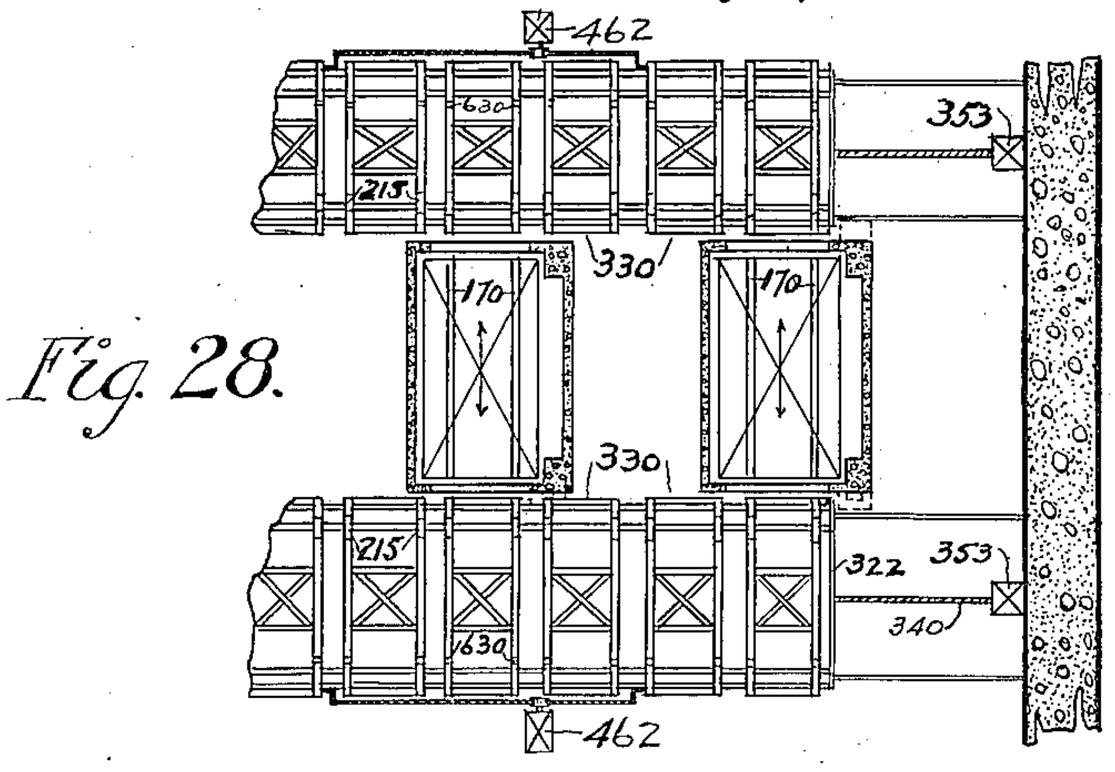
Inventor:
Conant W. Ruth.
By Rector, Hibben, Davis,
and Macauley, Attys

Sept. 4, 1928. 1,683,492

C. W. RUTH

MULTISTORY GARAGE

Filed May 14, 1923 25 Sheets-Sheet 15



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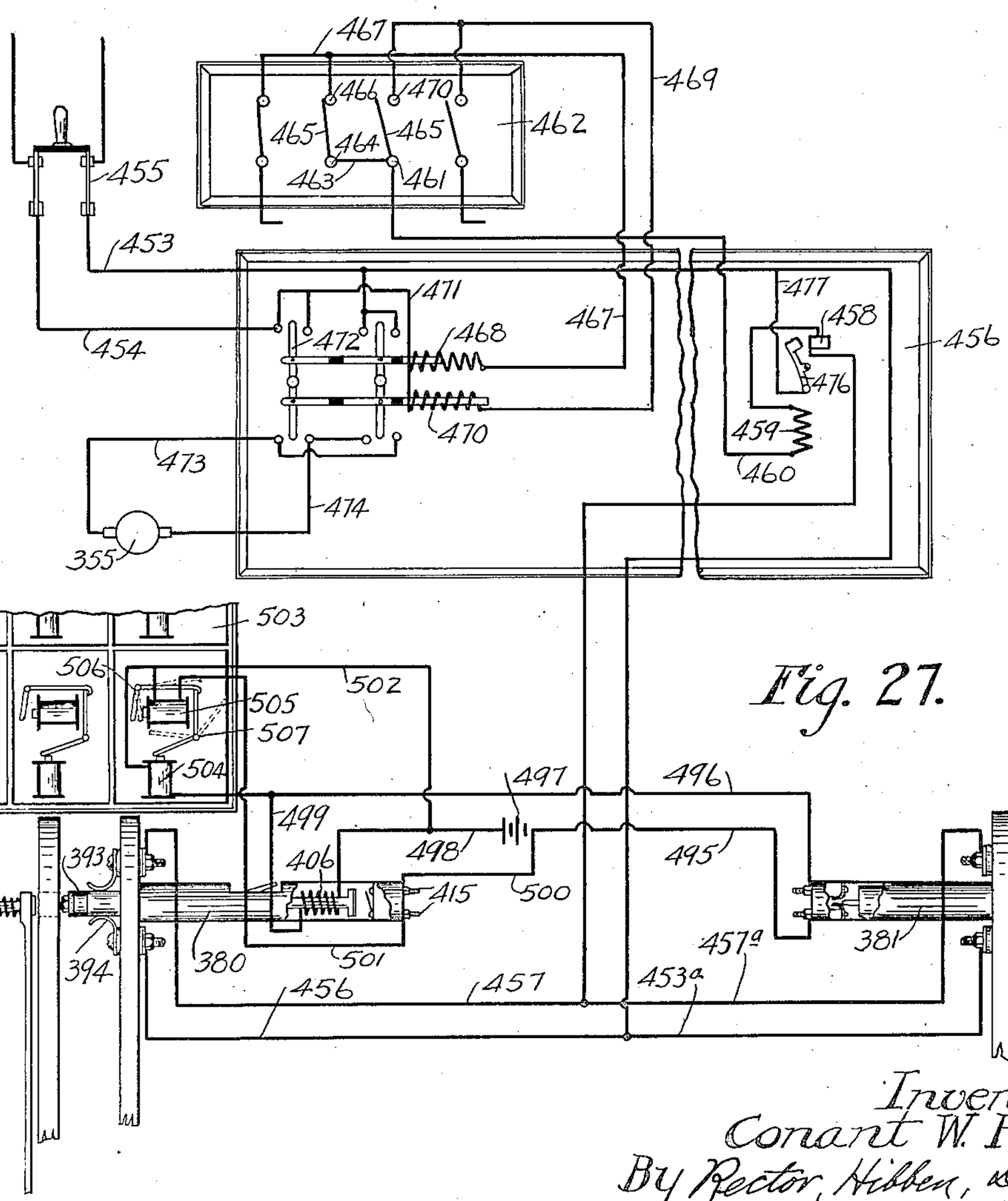


Fig. 27.

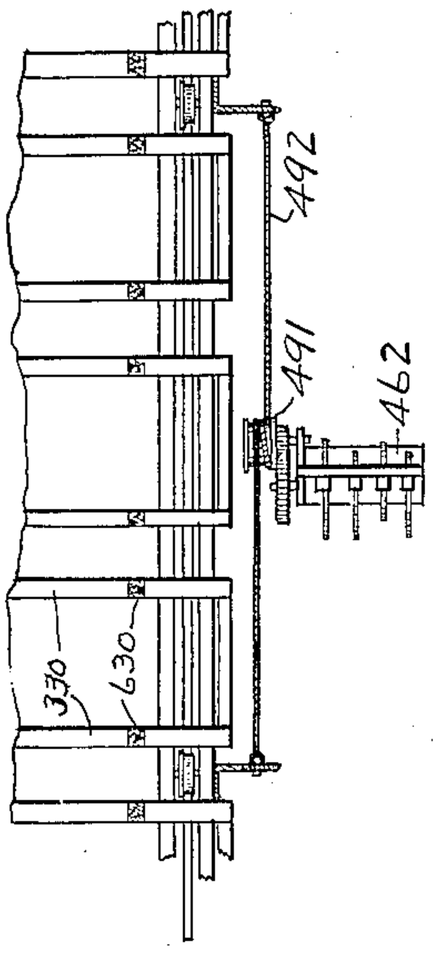
Inventor:
Conant W. Ruth,
By Rector, Hibben, Davis,
and Macauley, Attys.

Sept. 4, 1928. 1,683,492

C. W. RUTH

MULTISTORY GARAGE

Filed May 14, 1923 25 Sheets-Sheet 16



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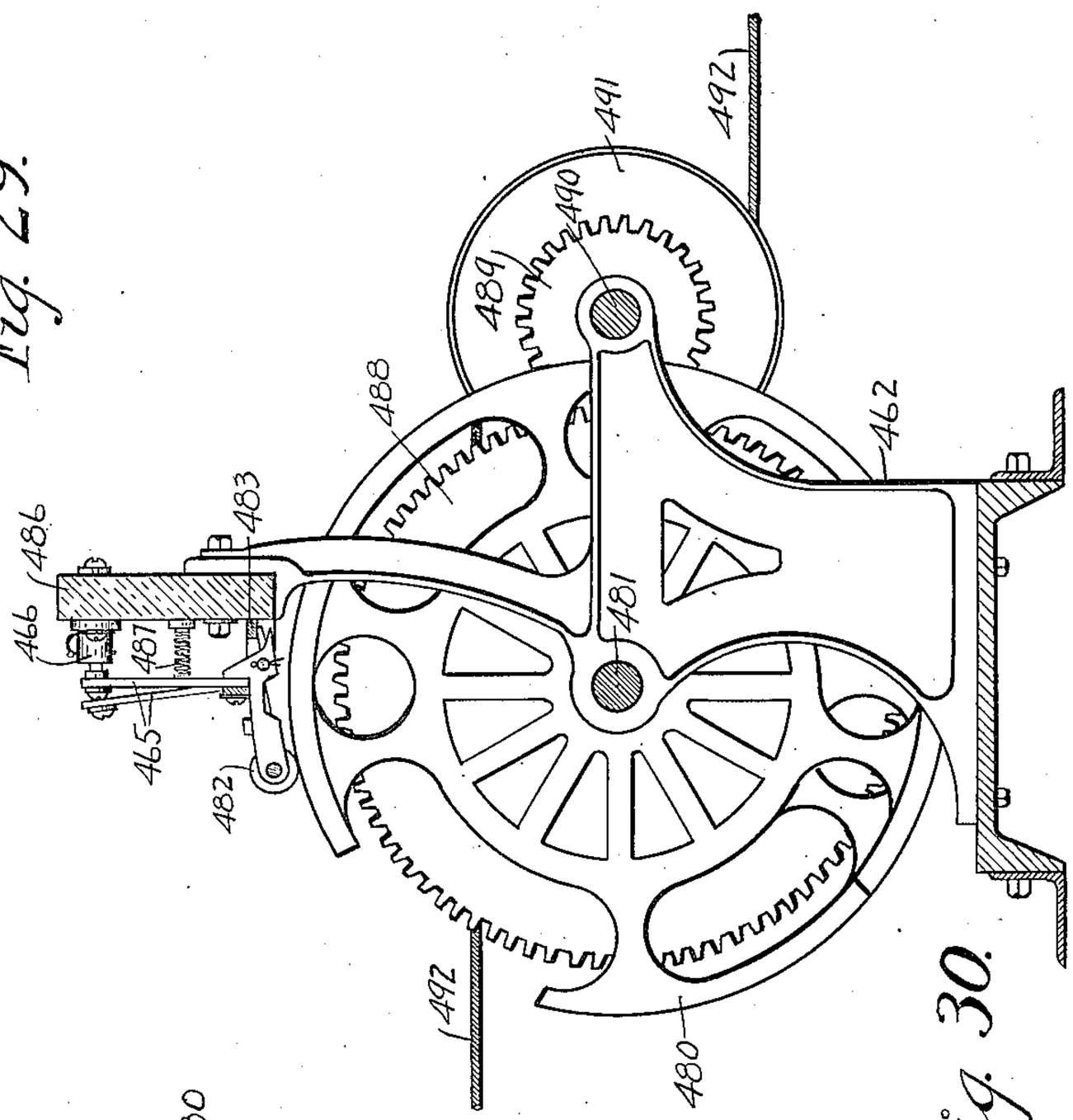

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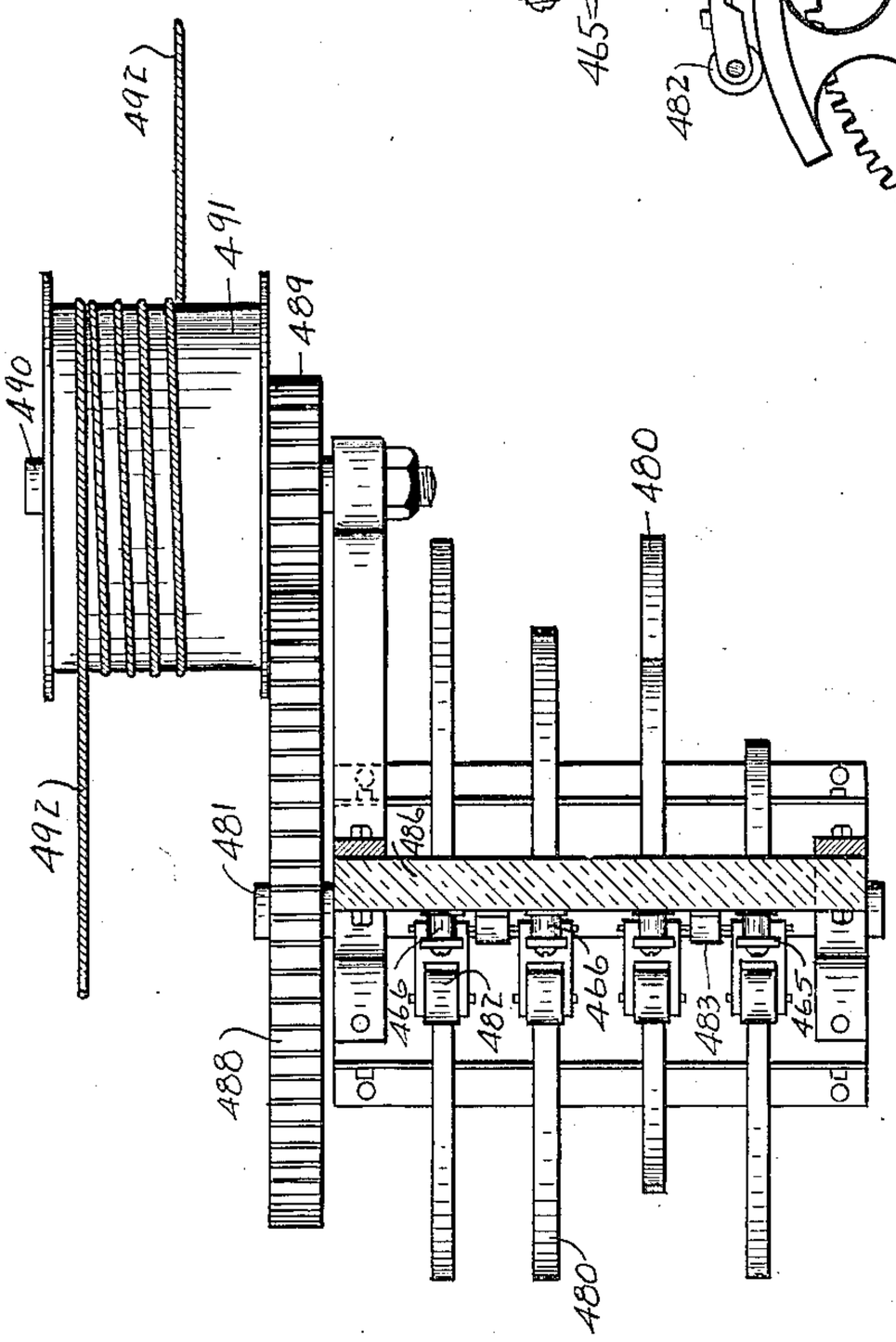


Fig. 31.

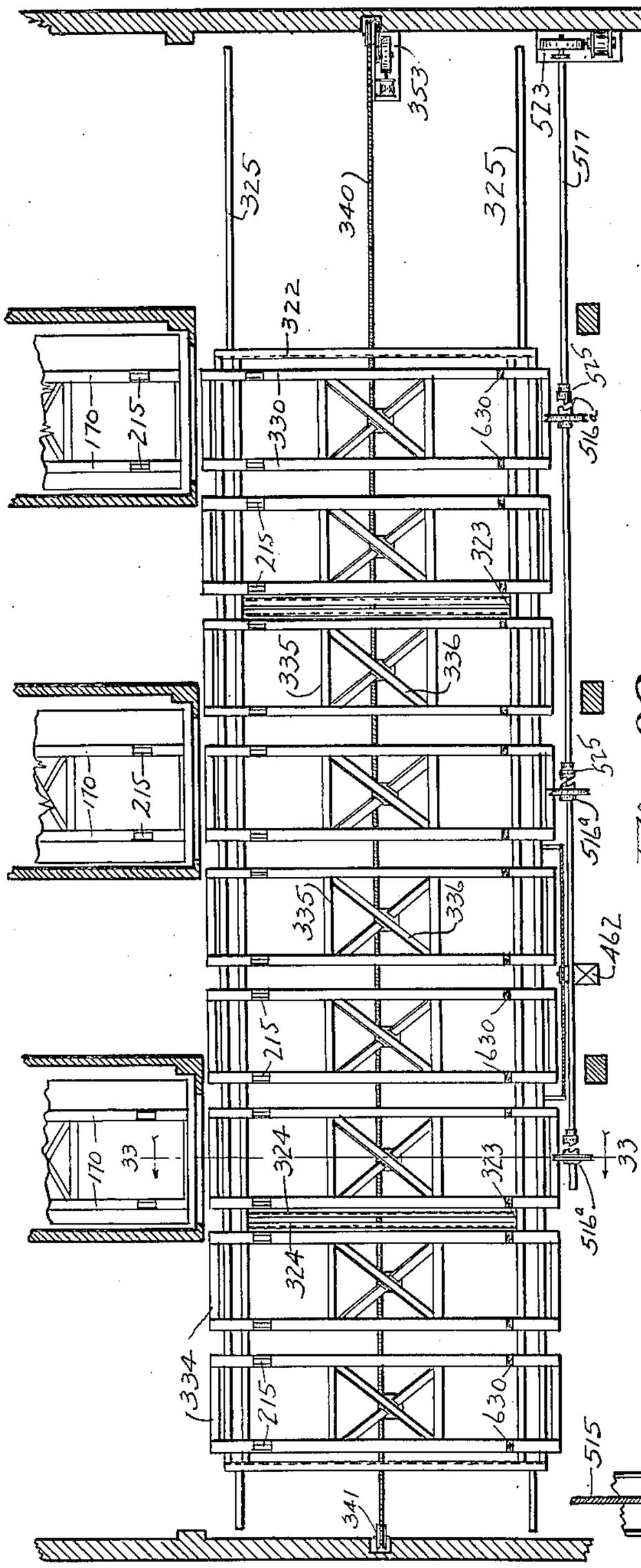
Inventor:
Conant W. Ruth,
By Rector, Hibben, Davis,
and Macauley, Attys.

Sept. 4, 1928. 1,683,492

C. W. RUTH

MULTISTORY GARAGE

Filed May 14, 1923 25 Sheets-Sheet 17



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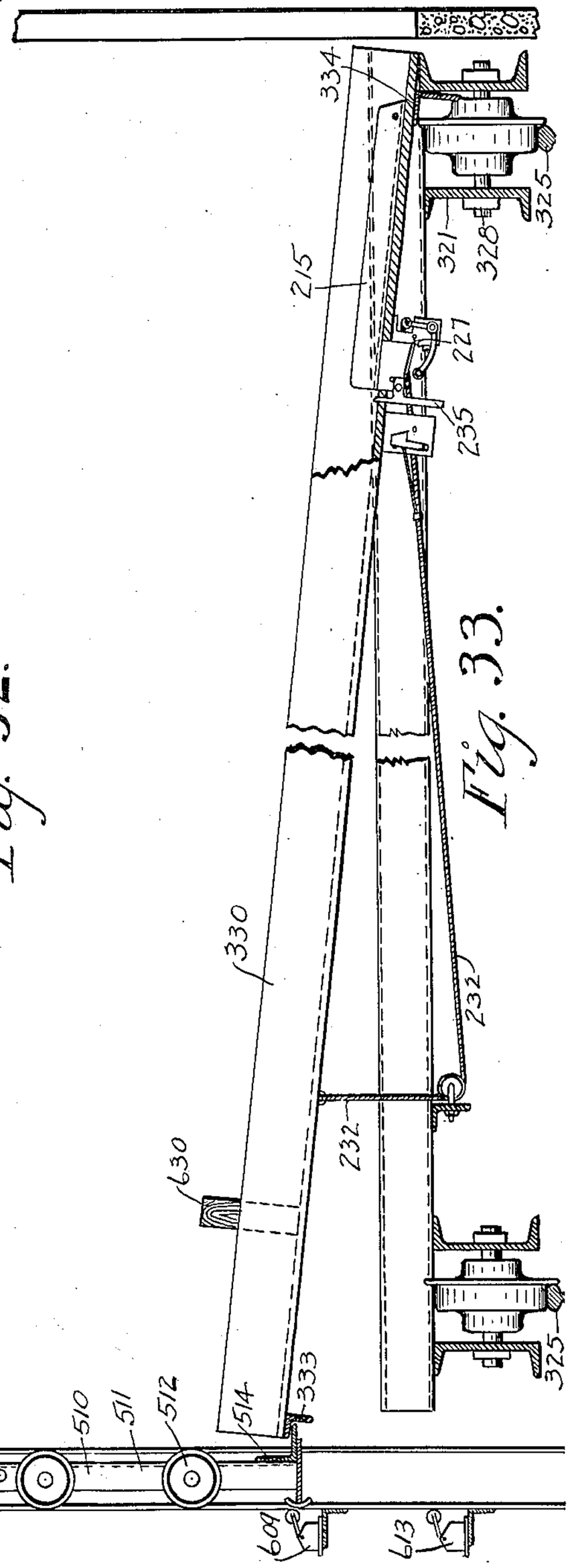

Fig. 33.

Inventor:
Conant W. Ruth
By, Rector, Hibben, Davis
and Macauley, Attys.

Sept. 4, 1928. 1,683,492

C. W. RUTH

MULTISTORY GARAGE

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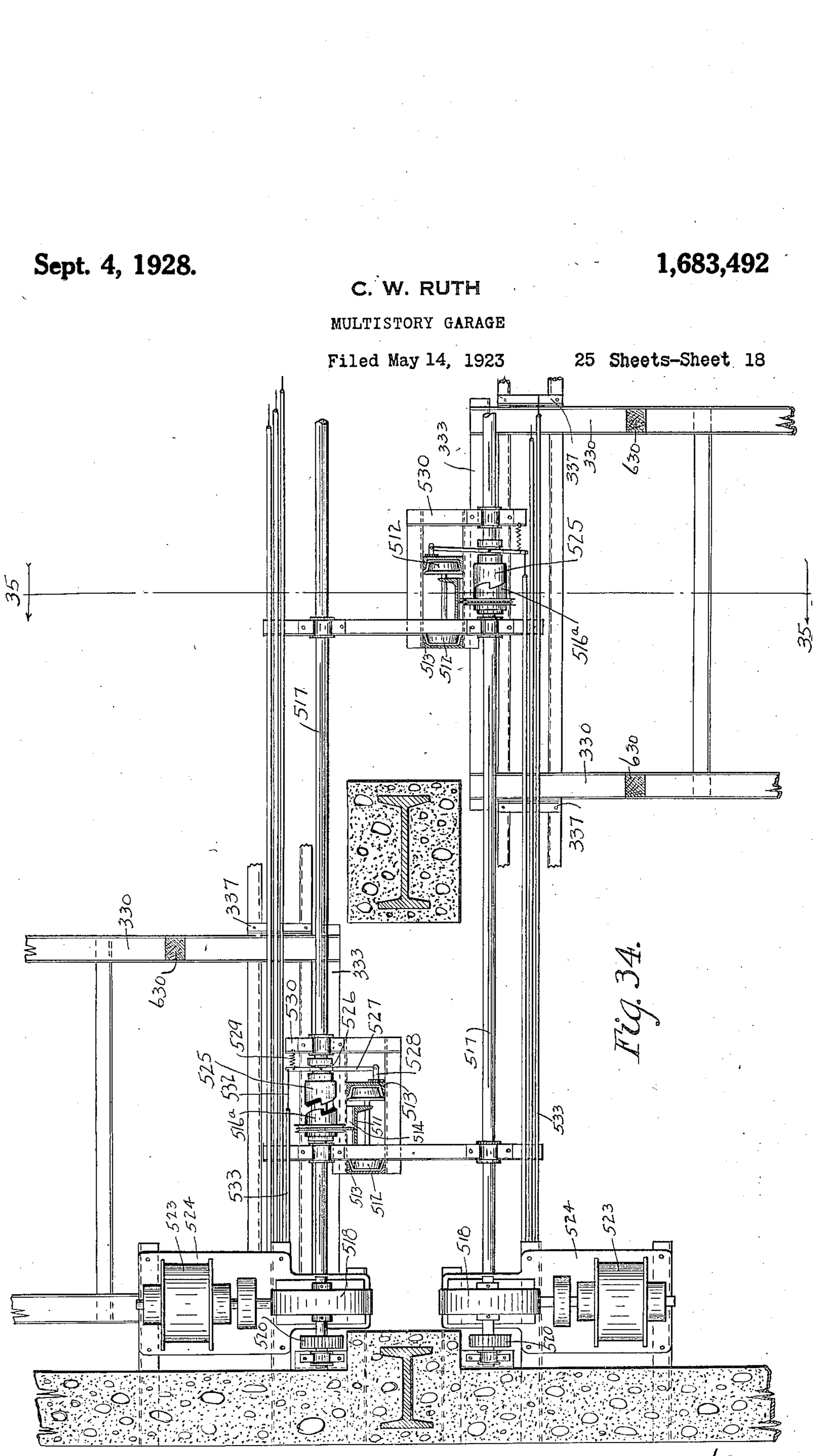

Fig. 34.

Inventor:
Conant W. Ruth,
By Rector, Hibben, Davis,
and Macauley, Attys.

Sept. 4, 1928. 1,683,492

C. W. RUTH

MULTISTORY GARAGE

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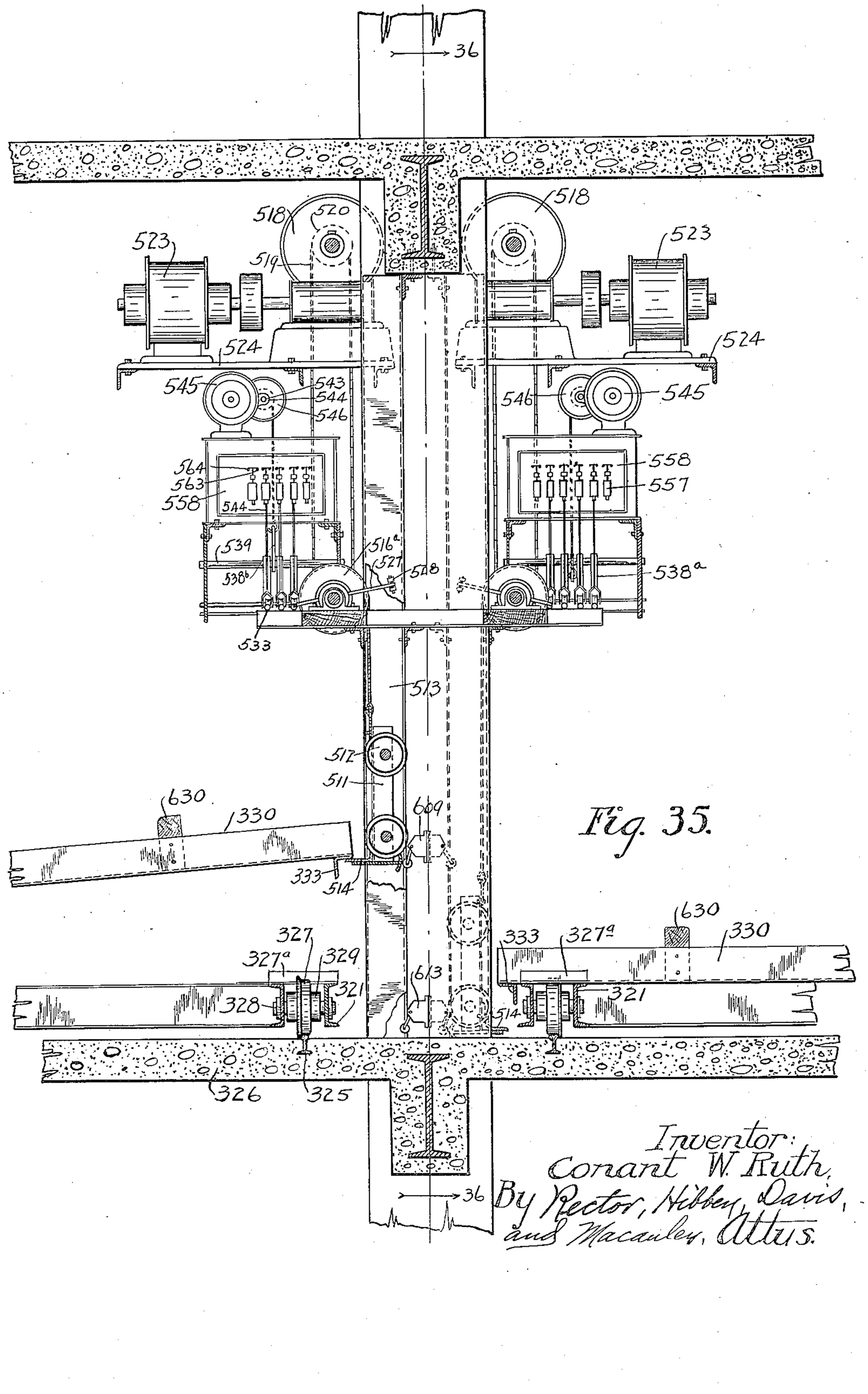

Inventor:
Conant W. Ruth,
By Rector, Hibben, Davis,
and Macauley, Attys.

Sept. 4, 1928. 1,683,492

C. W. RUTH

MULTISTORY GARAGE

Filed May 14, 1923 25 Sheets-Sheet 20

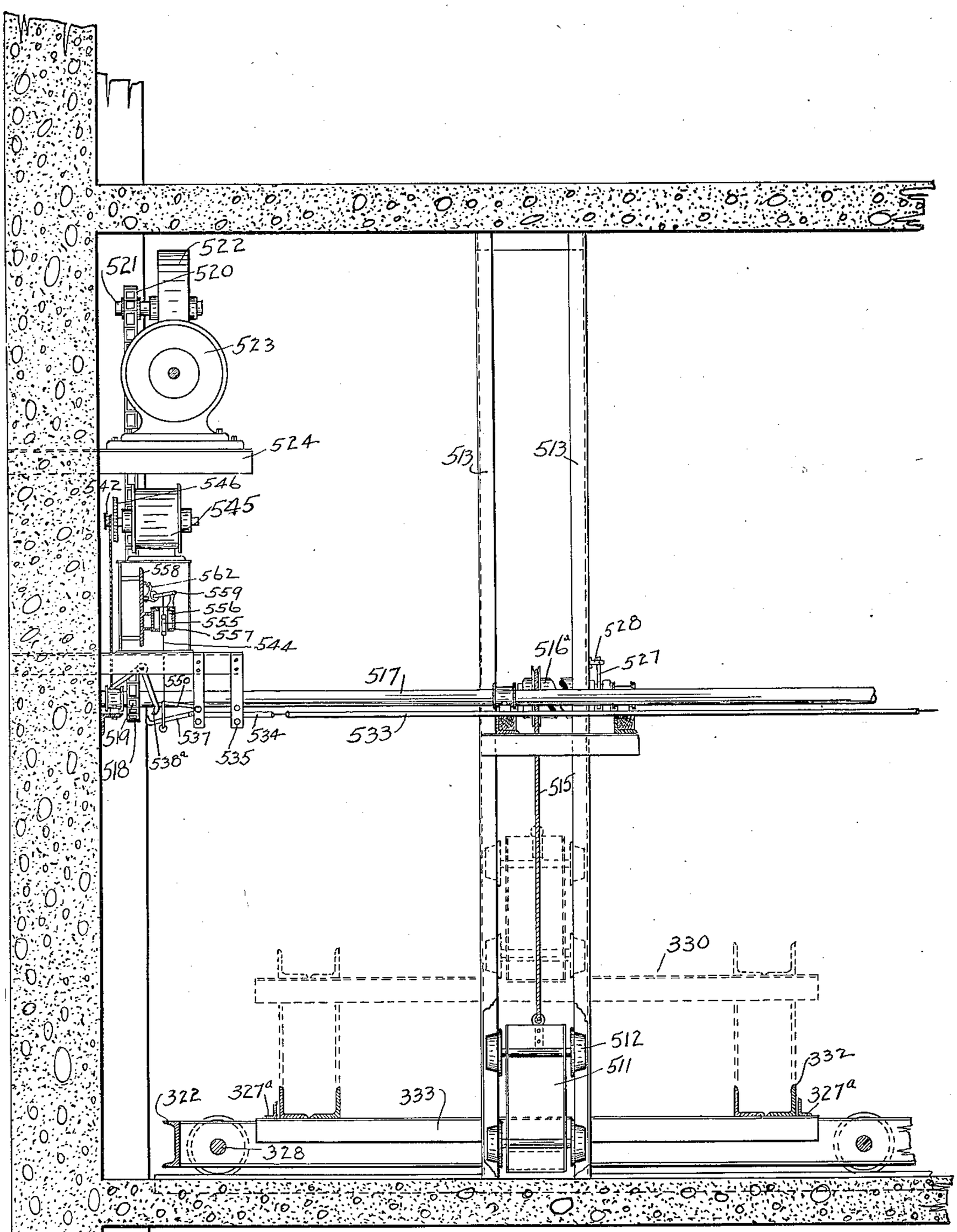

Fig. 36.

Inventor:
Conant W. Ruth,
By Rector, Hibben, Davis,
and Macauley, Attys.

Sept. 4, 1928.

1,683,492

C. W. RUTH

MULTISTORY GARAGE

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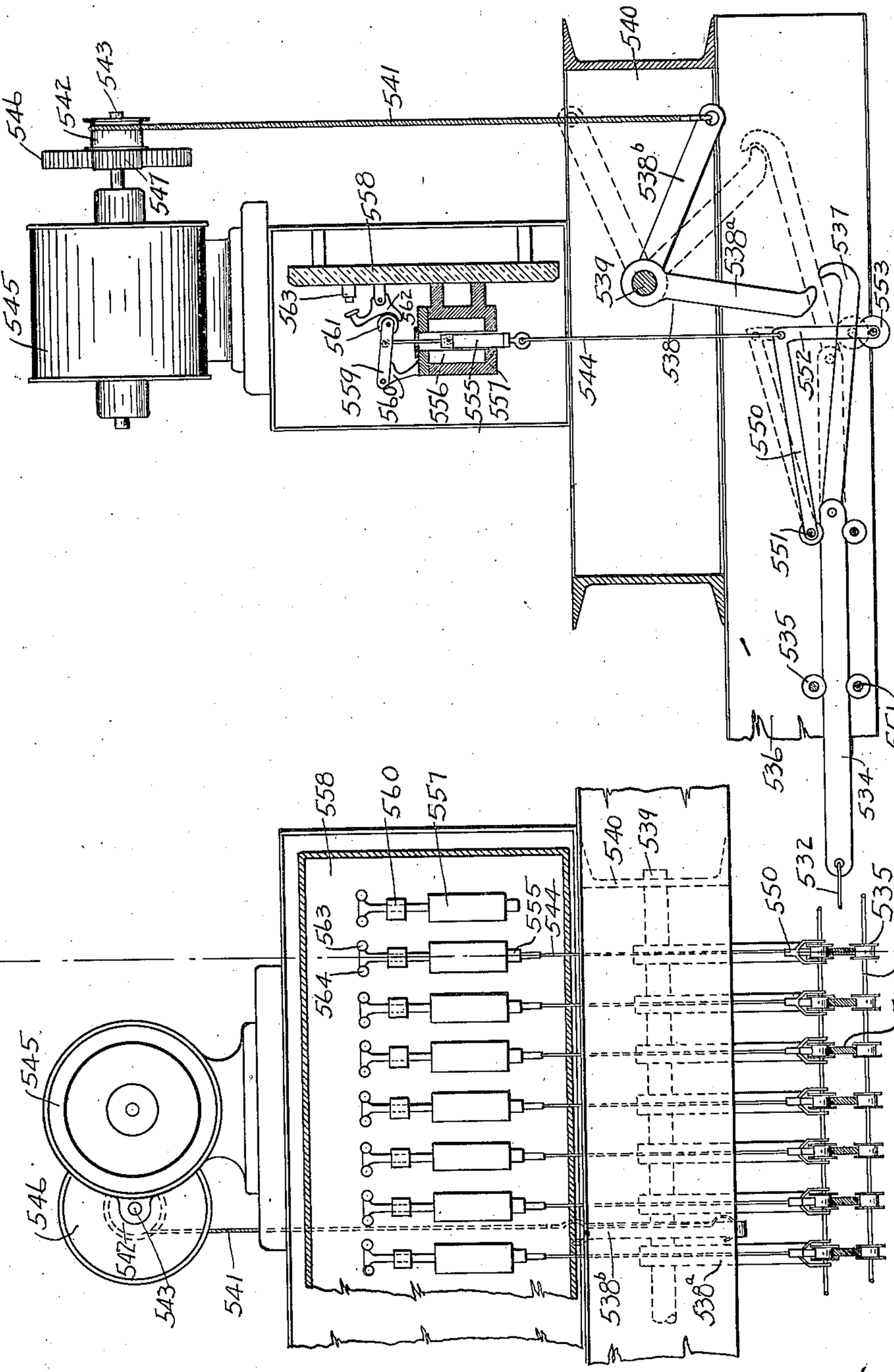

Fig. 38.

Fig. 37.

Inventor:
Conant W. Ruth.
By Rector, Hibben, Davis,
and Macauley, Attys.

Sept. 4, 1928.

C. W. RUTH

1,683,492

MULTISTORY GARAGE

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25 Sheets-Sheet 22

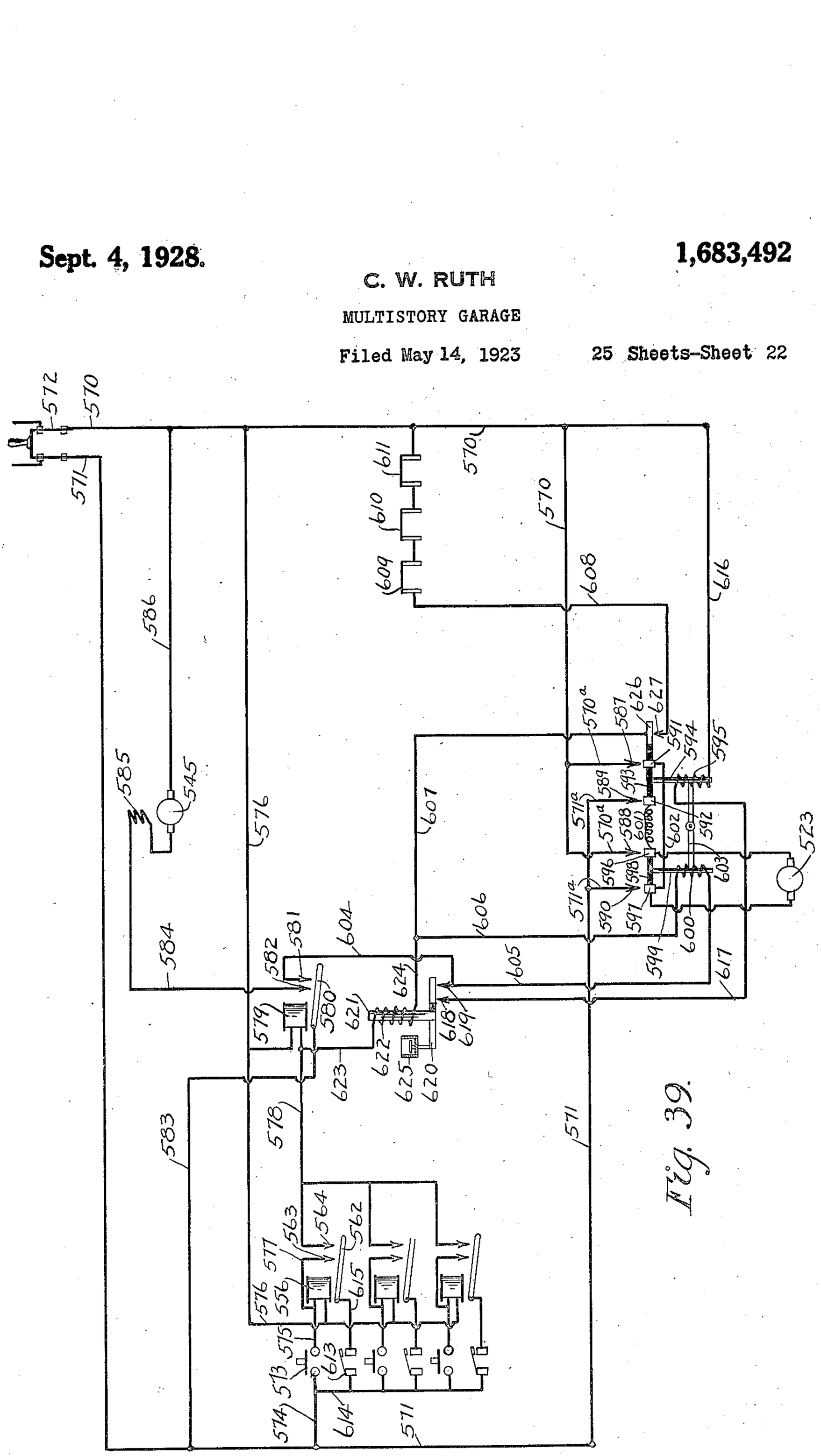

Fig. 39.

Inventor:
Conant W. Ruth.
By Rector, Hibben, Davis,
and Macauley, Attys.

Sept. 4, 1928. 1,683,492

C. W. RUTH

MULTISTORY GARAGE

Filed May 14, 1923 25 Sheets-Sheet 23

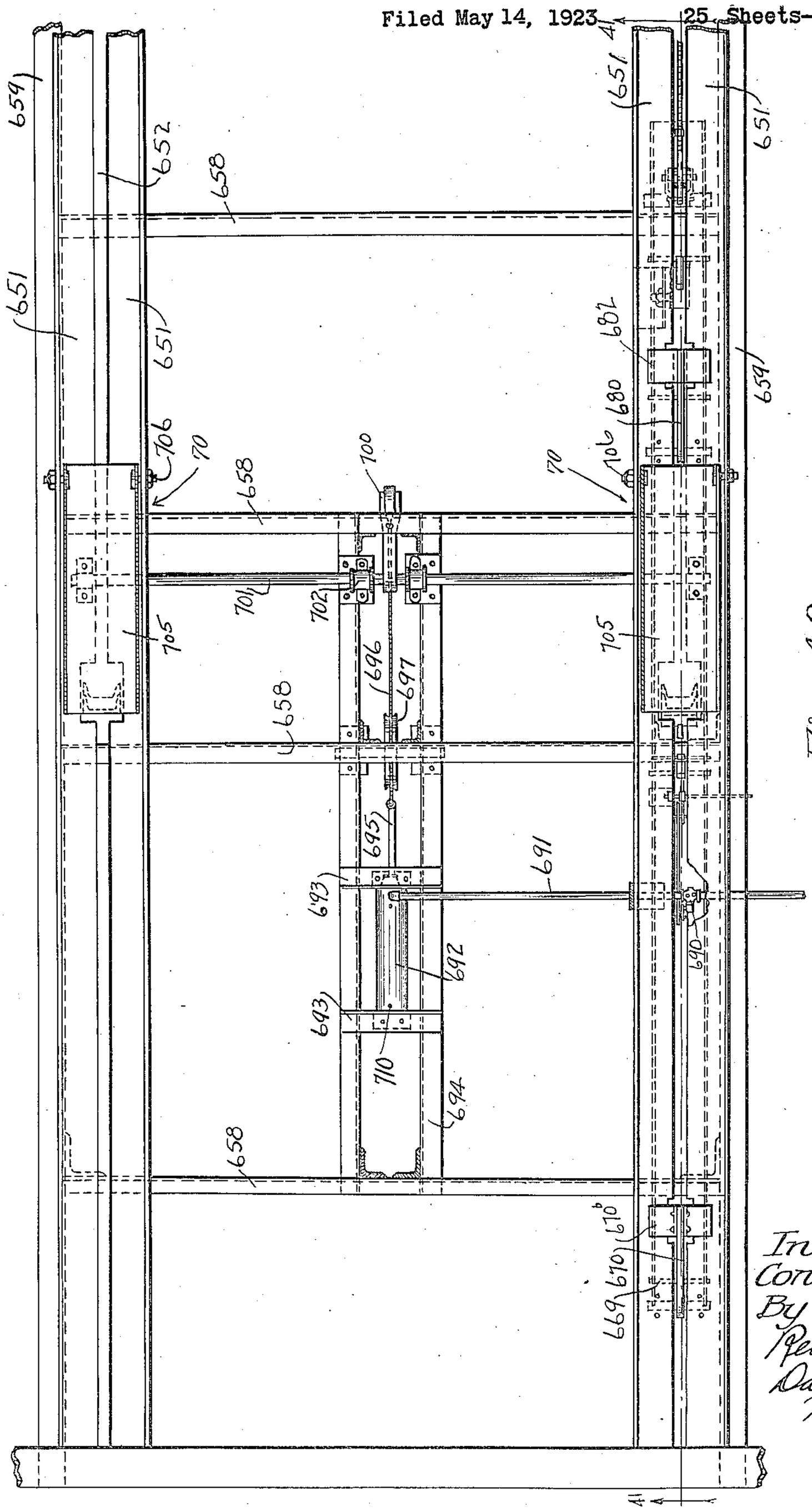

Fig. 40.

Inventor:
Conant W. Ruth,
By
Rector, Hibben,
Davis and
Macauley,
Attys.

Sept. 4, 1928. 1,683,492

C. W. RUTH

MULTISTORY GARAGE

Filed May 14, 1923 25 Sheets-Sheet 24

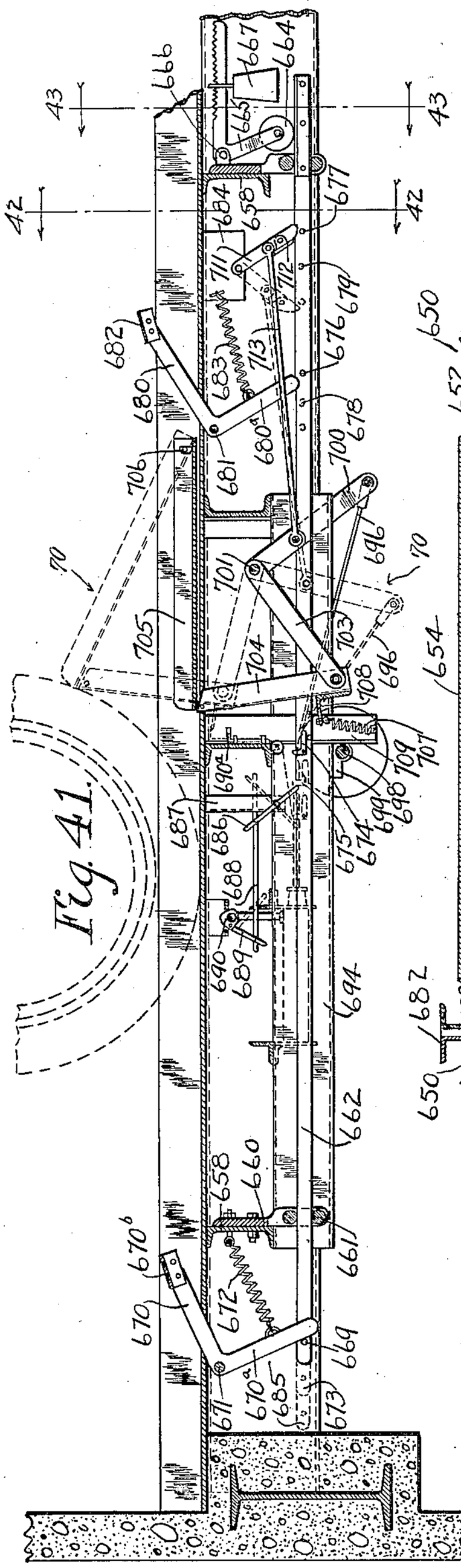

Fig. 41.

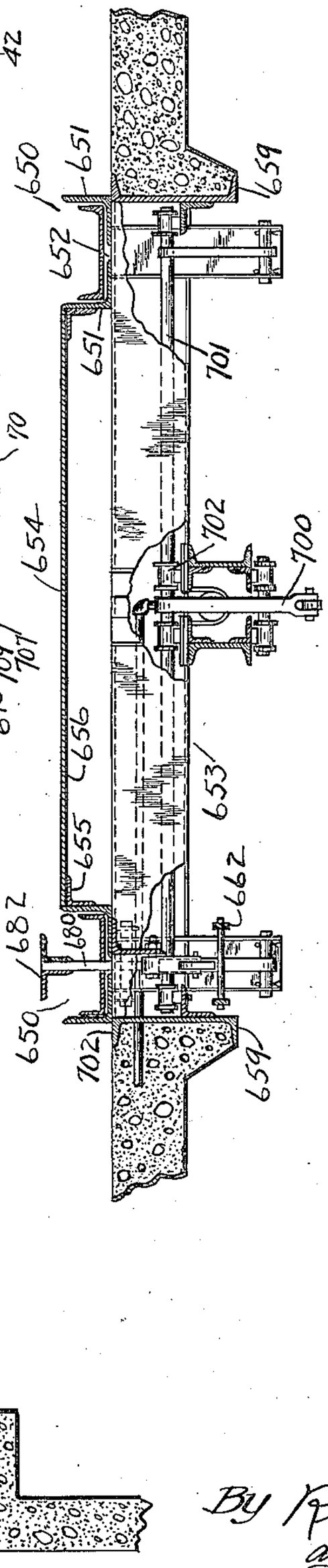

Fig. 42.

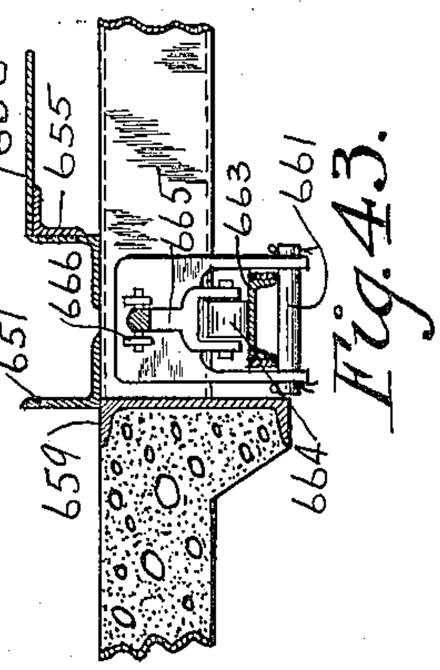

Fig. 43.

Inventor:
Conant W. Ruth,
By Rector, Hibben, Davis,
and Macauley, Attys.

Sept. 4, 1928. 1,683,492

C. W. RUTH

MULTISTORY GARAGE

Filed May 14, 1923 25 Sheets-Sheet 25

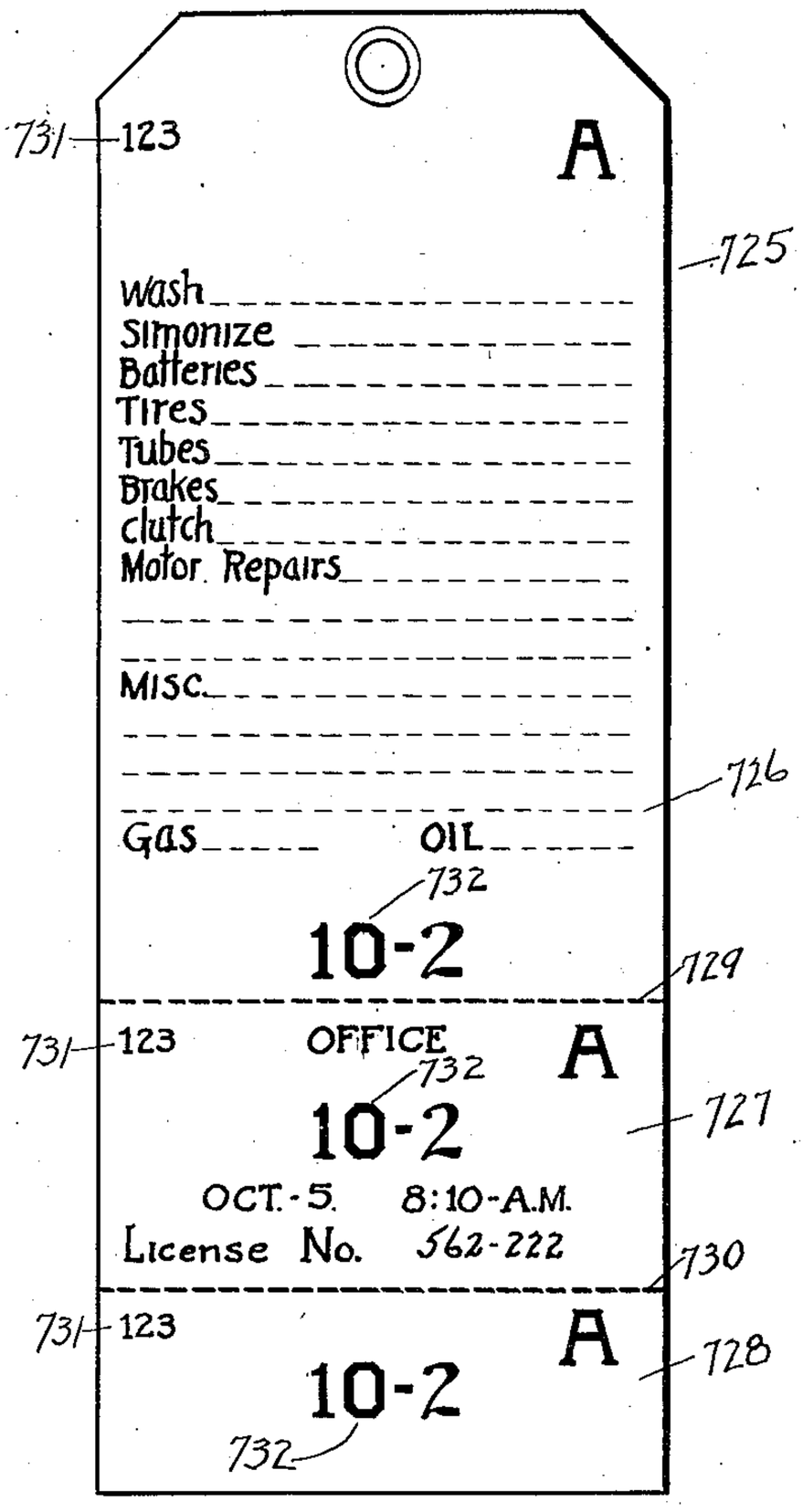

Fig. 44.

Inventor:
Conant W. Ruth.
By Rector, Hibben, Davis,
and Macauley, Attys.

Patented Sept. 4, 1928. 1,683,492

UNITED STATES PATENT OFFICE.

CONANT W. RUTH, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE C. W. RUTH ENGINEERING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

MULTISTORY GARAGE.

Application filed May 14, 1923. Serial No. 639,009.

This invention relates to improvements in garages and its purpose is to provide a multistory garage or building for the storage of automobiles or vehicles of similar nature within the limits of large cities where ground space is very valuable. The principal object of the invention is to provide a novel and improved means of storing a maximum number of automobiles within a given space and to provide means for quickly and cheaply handling automobiles within the garage so that any automobile may be placed in storage position or removed from the garage without interfering with any other automobile. A further object of the invention is to provide means for handling the automobiles through a combined mechanical and electrical apparatus so that after the car has entered the garage on one floor it can be moved to storage position on another floor by means of a selected elevator, movable supporting platforms or racks, and a series of horizontal movable tables, thus precluding the necessity of operating the car under its own power and substantially eliminating all gas fumes within the building. Another important feature of the invention is the provision of a garage building which is similar in design and general construction to any modern office building so that it may be readily converted to a different use should the necessity therefor arise.

The invention contemplates the provision of a series of elevator shafts in the building with loading platforms opposite the elevator shafts on the ground or entrance floor of the building. The automobile to be stored is driven onto one of these loading platforms which is then elevated at one end to cause the automobile to roll by gravity onto the elevator platform. The elevator is then operated to raise the automobile to an upper floor where it is to be stored, and when that floor is reached, the elevator platform is elevated at one end to cause the automobile to roll by gravity from the elevator platform onto one of a series of storage racks which are mounted on tables movable transversely of the elevator shaft. This construction enables any desired storage rack to be brought into position opposite one of the elevator shafts. When the owner wishes to withdraw the automobile from storage, the storage table is shifted to bring the car into position opposite one of the elevator shafts and the storage rack is then elevated at one end to cause the automobile to roll by gravity onto the elevator platform. When the elevator has been lowered to the ground or exit floor, the elevator platform is elevated at one end to roll the car therefrom onto the exit runway where automatic stop mechanism is provided for bringing the automobile to rest.

An important object of the invention is to provide mechanical and electrical apparatus for effecting the movement of the automobiles in the garage in the manner stated above. A further feature is the provision of means for accomplishing the various movements of the automobile automatically so that the number of attendents within the garage is reduced to a minimum. Still another object of the invention is to provide an improved ticket-checking system for preventing the theft or unauthorized removal of automobiles from the garage. Other objects of the invention relate to various features of construction and arrangement which will appear more fully hereinafter.

The nature of the invention will be understood from the following specification taken with the accompanying drawings in which one embodiment is illustrated. In the drawings, Fig. 1 shows a horizontal section through the walls and elevator shafts of the garage immediately above the ground or entrance floor of the building, illustrating the automobile run-ways along which the automobiles are received in and discharged from the garage; Fig. 2 shows a vertical section through the garage building and one of the elevator shafts, the section being taken longitudinally of an automobile run-way and illustrating the storage tables and racks on the upper floors as well as the loading platform and stop mechanism on the entrance and exit floor; Fig. 3 shows a horizontal section through the walls and elevator shafts immediately above one of the upper storage floors of the garage, illustrating the storage tables and racks on opposite sides of the rows of elevator shafts; Fig. 4 is a horizontal section through a portion of an elevator shaft on the ground or entrance floor, showing a plan view of the loading platform with the upper part thereof removed to reveal the operating mechanism; Fig. 5 is a longitudinal section taken on the line 5—5 of Fig. 4 showing a side elevation of the operating mechanism of a loading platform; Fig. 6 shows an

enlarged transverse section on the line 6—6 of Fig. 4, looking in the direction of the arrows; Fig. 7 is a diagrammatical view, showing the operating connections of the electrical and mechanical apparatus for controlling the elevation of the ends of the loading platforms, and also the means for operating the gates which are adapted to close the entrances to the loading platforms; Fig. 8 shows a side elevation of the three-way valve by which the flow of compressed fluid to the gate operating mechanism is controlled; Fig. 9 shows a detailed section through the valve on the line 9—9 of Fig. 8; Fig. 10 shows a top plan view of a portion of one of the track-ways of the loading platform, illustrating the switch by which the electric circuit of the gate operating mechanism is controlled; Fig. 11 is an enlarged detailed section through the casing of the switch illustrated in Fig. 10, illustrating a side elevation of the switch mechanism and the operating arm which is adapted to be operated by an automobile wheel passing onto the loading platform; Fig. 12 is a vertical section through the elevator car, with parts thereof broken away, showing the mechanism by which either end of the elevator platform is raised; Fig. 13 shows a longitudinal section through one of the upper or lower limit switches by which the electric circuits for controlling the movements of the elevator platforms and storage racks are regulated; Fig. 14 shows a horizontal section through one of the elevator shafts and the elevator car contained therein, the sections being taken on the line 14—14 of Fig. 12; Fig. 15 shows a horizontal section through one of the elevator shafts, illustrating a top plan view of the elevator car, with parts thereof broken away to reveal the mechanism for effecting the elevation of either end of the elevator platform; Fig. 16 is an enlarged detailed section through one corner of the elevator car frame, illustrating the guiding means for the lifting bars which are operatively connected to the ends of the elevator platform; Fig. 17 shows a vertical section through one of the push cars forming a part of the mechanism for lifting the ends of the elevator platform, the section being taken on the line 17—17 of Fig. 15; Fig. 18 is a diagrammatic view showing the electric circuit for effecting and controlling the operation of the mechanism by which the ends of an elevator platform are lifted; Fig. 19 shows an enlarged top plan view of a portion of one of the channel trackways of an elevator platform, together with the bumper mechanism mounted thereon for controlling the movements of an automobile; Fig. 20 shows a longitudinal section taken on the line 20—20 of Fig. 19; Fig. 21 shows an enlarged section taken transversely of the garage on the line 21—21 of Fig. 3, illustrating the mechanism for shifting one of the storage tables transversely of the garage on an upper storage floor of the building; Fig. 22 shows a front elevation of an instrument board supporting a positioning dial and an enunciator board adjacent each elevator shaft on the entrance floor of the garage; Fig. 23 shows a vertical section on the line 23—23 of Fig. 22 looking in the direction of the arrows; Fig. 24 is a section through the positioning dial of Fig. 22 taken radially thereof, and illustrating a longitudinal section of one of the tube switches which are carried by the disk mounted beyond the positioning dial; Fig. 25 shows a transverse section taken on the line 25—25 of Fig. 24; Fig. 26 is a sectional view similar to that of Fig. 24 taken through a dial located at the exit side of each elevator shaft, and illustrating one of the tube switches embodied therein for controlling the electric circuit of a storage table on another floor; Fig. 27 is a diagrammatic view of the electric circuit for controlling the mechanism for shifting one of the storage tables, this circuit having included therein the tube switches illustrated in detail in Figs. 24 and 26; Fig. 28 is a horizontal section through the walls of the garage and the elevator shafts above one of the upper storage floors of the building, illustrating the relative location and arrangement of the mechanism and devices for shifting the storage tables and racks and controlling the movements thereof Fig. 29 shows a somewhat diagrammatic plan view of a storage table and its storage racks, illustrating the driving connections between the storage table and the selector which is embodied in the electric circuit of Fig. 27 and adapted to control the movement of the storage table to effect a predetermined positioning of any of the storage racks mounted thereon; Fig. 30 shows an end elevation of the selector illustrated in Fig. 29; Fig. 31 shows a top plan view of the selector illustrated in Fig. 30; Fig. 32 is a horizontal section through the walls and elevator shafts of the garage above one of the upper storage floors, illustrating a top plan view of one of the storage tables and the storage racks carried thereby, with a partial representation of the mechanism for effecting the shifting movement of the table and the elevation of the ends of the storage racks; Fig. 33 is an enlarged detailed section taken on the line 33—33 of Fig. 32 illustrating one of the storage racks with one end thereof elevated; Fig. 34 is an enlarged detailed section taken horizontally through one wall of the garage above an upper floor thereof, illustrating in detail a portion of the mechanism, shown in Fig. 32, by which the ends of the storage racks are elevated; Fig. 35 is a section taken vertically on the line 35—35 of Fig. 34 illustrating the operating connections from the driving motors to the shafts

by which the ends of the storage racks are elevated; Fig. 36 shows a vertical section taken transversely of the garage on the line 36—36 of Fig. 35; Fig. 37 shows an enlarged front elevation of one of the groups of electromagnetic devices, illustrated in Fig. 35, which are adapted to effect a selective operation of the mechanism for lifting the ends of the various storage racks on one storage table; Fig. 38 is a detailed section taken on the line 38—38 of Fig. 37 looking in the direction of the arrows; Fig. 39 is a diagrammatic view of the electric circuit including the electro-magnetic devices and the electric motors by which the lifting of the ends of the storage racks is effected and controlled. Fig. 40 is a top plan view of one of the exit run-ways on the discharge side of the elevator shaft on the ground floor of the building, showing the stop mechanism by which an automobile is brought to rest after rolling by gravity from an inclined elevator platform; Fig. 41 shows a longitudinal section taken on the line 41—41 of Fig. 40; Fig. 42 shows a transverse section taken on the line 42—42 of Fig. 41; Fig. 43 shows a detailed section taken on the line 43—43 of Fig. 41; and Fig. 44 shows a plan view of one of the storage tickets or receipts for preventing the unauthorized removal of automobiles from the garage.

A garage building embodying the present invention should preferably be constructed of fire-proof materials and be arranged on the general plan of a modern office building so that it may be converted to that or any other use if desired. The building may be of any desired number of stories in height, the upper floors being used for the storage of automobiles while the lower floor is used preferably for the entrance and exit of the automobiles to be stored, although the automobiles may be discharged on any other floor than the entrance floor if desired. As shown in Fig. 1 of the drawings, the ground floor or entrance floor 50 is provided between the side walls 51 of the building with a number of parallel automobile runways 52 which extend throughout the building from one end to the other. The runways 52 are separated by curbs or guide members 53, formed of concrete or other suitable material, and the end walls of the building are provided at the ends of the runways with entrance and exit doors. Each runway 52 leads through an elevator shaft 54, the walls 55 of these elevator shafts being built over the curbs or guides 53 and being located in alignment with the building columns 56 so that these parts of the construction do not interfere with the straight runways extending through the garage. The elevator shafts are preferably located in rows extending transversely of the garage and to permit the construction of the walls of the elevator shafts over the guides or runways in alignment with the building columns, elevator shafts for alternate runways are arranged in a separate row and staggered with respect to the elevator shafts of the intermediate runways. An automobile entering the garage passes onto a loading platform 60 which is positioned in the floor of the runway adjacent to the elevator. These loading platforms are represented diagrammatically in Fig. 1. After being brought onto the loading platform 60, one end of this platform is elevated as shown in Fig. 2, thus causing the automobile 62 to roll by gravity onto the platform 63 of the elevator car 64. The car is then raised to the desired upper floor of the building where the automobile is to be stored and when it reaches that floor, the platform 63 is elevated at one end to move the automobile onto a storage rack which is located on a movable storage table. An automobile 67 is shown in position on one of these storage tables on the second floor of the building, as illustrated in Fig. 2. When the owner wishes to withdraw the automobile from storage, the table on which the car is stored is shifted to bring the rack, which supports the automobile, into position opposite the elevator car which has previously been positioned in alignment with the storage table. The storage rack is then elevated at one end to move the automobile onto the platform of the elevator. At all points where the automobiles pass to or from the elevator cars, the space between the elevator platform and the adjacent loading platform or storage rack is bridged by a fixed concrete ledge 69 which forms a part of the building construction. The storage platform which is thus elevated at one end is illustrated on the third floor of the building, as shown in Fig. 2, the automobile 68 being shown passing onto the elevator which is illustrated in that position by solid lines. After the automobile is in position on the elevator platform, the elevator is lowered to the ground or exit floor. and the platform 63 of the elevator is then raised at one end to move the automobile onto the exit runway where it is engaged and stopped by suitable stop mechanism 70 which is designated diagrammatically on the exit side of each elevator in Figs. 1 and 2.

The loading platforms 60 and the mechanism for operating them are located in pits 72 which are positioned in the floors of the runways 52 adjacent the elevator shafts. These pits preferably have concrete floors and walls and the I-beams 73 which constitute a part of the steel frame of the building are embedded in the end walls of these pits as shown particularly in Fig. 5. Each loading platform 60, and the mechanism for operating it, is supported by a pair of channel beams 74 which extend longitudinally of the pit with their ends embedded in the end walls thereof and secured to the I-beams 73. Each

loading platform 60 comprises of side frame members 75, in the form of channels having their flanges directed inwardly. These channels are connected by cross frame members 76, which are also in channel form, and the frame structure thus formed supports a pair of track members 77 of channel form which have their flanges directed upwardly to receive the wheels of the automobile between them. The space between the two track members 77 is closed by a sheet metal plate 78 having down-turned flanges 79 which are secured to the side-walls of the track members. The side frame members 75 of the platform have brackets 80 secured thereto and extending downwardly, these brackets and the side frame members serving as supports for sheet metal plates 81 which close the spaces at the sides of the platform when one end thereof is elevated. A transverse frame member 82 is secured to the longitudinal frame member 74 within the pit, at the end thereof adjacent the elevator shaft and this frame member has brackets 83 secured thereto and connected by pivots 84 to similar brackets secured to the under sides of the platform frame members 75. The opposite end of the loading platform 60 is normally supported by an angle bar 85 which is secured to a transverse channel 86, forming a part of the floor structure, and which has its flange directed inwardly to underlie the transverse frame member 76 at the end of the loading platform.

When an automobile is driven onto the loading platform 60 with the wheels traveling in the channels 77, one of the front wheels travels over a switch 88 comprising an arm 89 which is pivoted at 90 on a bracket 91^a formed on the switch housing 91 and which has a plurality of rollers 92 mounted on the other end thereof and extending upwardly through a series of slots 93 which are formed in the channels 77, as shown in Figs. 10 and 11. The arm 89 is in the form of a bell-crank lever having a downward projection 89^a provided with a fibre roller 89^b at its lower end. This roller contacts with a cam surface 94^a on a contact member 94 which is pivoted at 94^b and normally moved in an upward direction by a spring 94^c. When the arm 89 is moved downwardly, the roller 89^b passes over the hump on the cam surface of the contact member 94 and causes the projection 94^d thereof to engage the carbon contact 95^a of a terminal 95. This terminal 95 and the member 94 are connected to electrical conductors 96 and 97 respectively, which lead to line conductors 98 through a switch 99. One of these conductors 96 includes a solenoid 100 having a magnetizable core 101 which, when the solenoid is energized by the closing of the switch 88, moves longitudinally and engages a lever 102 adapted to operate a three-way valve 103. This valve is connected in the compressed air supply line 104 leading to a cylinder 105 and is closed when the lever arm 102 extends vertically downward as illustrated in Fig. 7, but when the lower end of the lever is engaged by the core 101, the lever snaps out of this vertical position under the influence of a coil spring 106 which connects the lower end of the lever with a bracket 107 secured to the inlet pipe 108 above the valve. When the lever snaps over to the position illustrated by the dotted lines in Fig. 7, the supply pipe 108 is connected by the valve with the inlet pipe 104 leading to the cylinder 105 and the piston within the cylinder is then actuated by compressed fluid to move the piston rod 109 downwardly. This piston rod is connected to a cable 110 which extends over a pulley 111, rotatably mounted on a standard 112 extending upwardly from the floor 50, and on the other side of this pulley the cable 110 is connected to a weight 113. The lower end of the weight is connected to another cable 115 which passes around a pulley 116 pivoted on the frame member 74. The other end of the cable is carried longitudinally within the pit 72 and is connected to a rod 117 mounted to slide in guide members 118 which are carried by frame member 119 by means of a spring 120 which is mounted thereon between the members 118 and secured thereto at one end by pin 121. When in this projecting position, the end of the rod 117 engages a hole 122 formed in a vertical stem 123 having a handle 124 at its upper end.

The movement of the cable 115 to release the rod 117 from the stem 123 takes place simultaneously with the rotation of a shaft 125 mounted on the standard 112 and having the pulley 111 fixed thereon. This shaft is connected to a double arm or gate 126 which is moved downwardly across the runway 52 leading to the loading platform so that, after one car has passed onto the platform, the actuation of the switch 88 and the closing of the gate prevents the driver of a second automobile from projecting the forward end of his automobile over the rear end of the loading platform while the first automobile is still in position thereon. The movement of the rod 117 when the gate 126 is lowered, releases the stem 123 extending upwardly through the floor, so that the operator can seize the handle 124 and pull the stem 123 upwardly thereby opening a valve 128 located in a compressed air supply line 129 leading to the cylinder 130. This cylinder is secured by straps 131 to the longitudinal frame members 74 within the pit and the piston within this cylinder is connected to a piston rod 132 having its outer end attached to a cable 133. This cable extends once around a pulley 134 and has its other end secured to the periphery of the pulley so that when the piston is actuated within the cylinder the cable rotates the pulley and the shaft 135

on which the pulley is fixed. This shaft is journaled in bearings 136 carried by angle bars 137 secured to the longitudinal frame members 74. The opposite ends of the shaft 135 have drums 138 keyed thereon and each drum has a cable 139 secured thereto at one end and wound thereon with the other end of the cable, extending downwardly and secured to a pin 140 mounted between the flanges of a channel bar 141. These channel bars extend vertically with their upper ends pivoted at 142 to brackets 143 secured to the table 60 and, when the drums 138 are rotated to wind up the cables 139, the bars 141 are adapted to ride on the peripheral surfaces of the drums 138 as the rear end of the platform 60 is elevated.

The upward movement of the platform 60 actuates a cable 145 which is connected at one end to one of the transverse frame members 76 of the platform and which extend around pulleys 146 mounted in brackets carried by a frame member 74. The other end of this cable is carried upwardly and connected to a transverse rod 147, the ends of which engage a pair of stop members 148, each adapted to extend upwardly through an opening 149 formed in one of the track members 77. These stop members are guided in their movements by a pair of levers 150 which are pivoted on the ends of the rod 147 and pivoted at their other ends on a rod 151 which is mounted in plates 152 carried at the end of an angle bar 153 extending transversely of the pit and secured to the frame members 74. These levers 150 are normally held in their upper positions in contact with one of the transverse frame members 76 of the table, by means of coil springs 154 which connect the levers with the under sides of the track member 77. With the levers in their upper positions, the stop members 148 project upwardly through the track members and engage the front wheels of the automobile to limit the forward movement thereof. When the loading platform 60 is elevated by the mechanism operated by the compressed air cylinder 130, the cable 145 lowers the stop members 148 and is adapted to move the stop members below the upper surfaces of the track members after the rear end of the platform 60 has reached the limit of its upward movement. Being thus released by the lowering of the stop members while supported on the inclined track members, the automobile rolls by gravity from the platform onto the platform 63 of the elevator; assuming that the fire doors of the elevator shaft have been opened as hereinafter explained.

As the loading platform 60 reaches the upper limit of its movement, the arm 89 of the switch 88 is lifted by a small cable 155 which connects it with the under side of the table as shown particularly in Fig. 7. This movement of the arm 89 disconnects the conductors 96 and 97 so that the solenoid 100 is deenergized. At the same time that the switch 88 is opened, the lever 102 is snapped back into its vertical position by a cable 156 which connects the upper end thereof with the under side of the table 60. When this occurs, an opening is established through the valve 103 to the outer atmosphere so that the compressed air in the cylinder 105 can escape through the valve and the piston rod 109 is then restored to its upper position through the action of the weight 113 and the coil spring 120. At the same time, the rotation of the shaft 125 restores the gate 126 to its vertical position. As the rod 117 is restored to its normal position by the spring 120, it engages the hole 122 in the stem 123 which carries the handle 124. This handle will have been released by the operator when the automobile rolls from the platform 60 onto the elevator platform 63 and the stem 123 will have dropped to its normal position with the hole 122 located in alignment with the rod 117. The dropping of the stem 123 closes the valve 128 by which the compressed air has previously been admitted to the cylinder 130 and the compressed air is then permitted to escape from the cylinder 130 through the operation of a valve 157 connected in a vent pipe 158 leading from the front end of the cylinder. This valve 157 is opened to establish a communication from the vent pipe 158 to the outer atmosphere by cable 159 which connects the operating level of the valve with the outer end of the piston rod 132 so that when the table 60 reaches the upper limit of its movement, the cable 159 becomes taut and opens the valve 157. After the compressed air has been shut off from the cylinder 130 and the valve 157 opened, the weight of the table 60 pushes the channel bars 141 downwardly and unwinds the cables 139 from the drums 138, thereby simultaneously winding up the cable 133 on the pulley 134, thus restoring the piston rod 132 to the position illustrated in Fig. 7. At the same time, the piston rod 132 restores the valve 157 to its closed position through the operation of the cable 159. The table 60 is thus returned to its horizontal position and the gate 126 has previously been elevated by the rotation of the shaft 125, so that all parts of the apparatus are again in readiness to receive another automobile on the loading platform.

Each elevator car 64 comprises a frame including lower longitudinal frame members 160 connected by transverse frame members 161. From the corners of the rectangular frame thus formed, four vertical posts 162 extend upwardly and unite the lower frame members with an upper frame comprising longitudinal frame members 163 and transverse frame members 164. The corner posts are connected at the sides of the car by side walls 165 which extend upwardly through a portion only of the height of the car. The cage formed by these frame members, and

illustrated particularly in Figs. 12, 14 and 15, is suspended in another frame structure comprising the vertical guide frames 166 which are connected beneath the car by the transverse channel beams 167. These guide beams are connected above the car by transverse channel beams 168 and the cables 169 by which the car is elevated or lowered are connected to the transverse beams 168 as shown particularly in Fig. 2. The vertical guide frames 166 are guided in the elevator shaft by shoes 166ª which are secured thereto and provided with vertical grooves to be engaged by the T-beams secured to the walls of the shaft. The platform of the elevator comprises two channel trackways 170 each made up of two angle bars 179 which are spaced slightly apart to permit the escape of water and dirt which would otherwise collect therein. These track members are connected by a number of transverse frame members 172 and the structure is braced by diagonal frame members 173 located in the central part thereof. The ends of the platform 63 rest on rods 174 which extend transversely of the elevator with their ends secured to vertical lifting bars 175, each of which is located adjacent one of the corner posts 162. The rods 174 are adapted to slide on the surface of the posts 162 when the lifting bars 175 are elevated. The bars 175 at each end of the elevator are connected by a transverse channel 177 and the upper end of each bar also has a hook member 178 secured thereto and extending around the adjacent post 162 to guide the lifting bars in their vertical movements.

The lifting bars 175 are elevated to raise either end of the elevator platform by means of hoisting mechanism mounted on a frame structure carried by the channel beams 180 which extend between the guide beams 166 adjacent the upper part of the elevator car. The channels 180 support longitudinal frame members 181 which are connected by transverse frame members 182 and the corners of the platform thus formed are connected by vertical frame members 183 to the transverse channels 184 extending transversely of the car and secured to the under sides of the upper frame members 163. The platform mounted on the channel beams 180 carries an electric motor 185 having a pinion 186 mounted on its shaft to mesh with a large gear 187 mounted on the shaft of a speed reducer 188. The secondary shaft 189 of this speed reducer has two drums 190 mounted on the ends thereof and a cable 191 is wound around each drum and secured to it at its middle point. The ends of the cables are extended in opposite directions and connected to small cars 192. Each car comprises a frame 193 having shafts 194 secured thereto and flanged wheels 195 rotatably mounted on the projecting ends of these shafts. These flanged wheels are adapted to travel in the longitudinal frame members 163 and in similar channel frame members 196 spaced inwardly therefrom as shown particularly in Figs. 15 and 17. The cables 191 are endless and are passed around pulleys 199 mounted on shafts 200 which are journaled in bearings carried by brackets 201 secured to the frame members 163 and 196 between the cars 192 and the ends of the elevator car. The rotation of the drums 190 and the movement of two of the cars 192 in one direction is therefore adapted to move the other two cars 192 in the other direction. These cars act as pushers for other similar small cars 205 which travel on the same channeled frame members 163 and 196 and are located between the cars 192 and the drums 190. The movement of either pair of cars 192 inwardly toward the drums 190 causes those cars to engage one pair of the cars 205, thereby pushing the cars 205 with them and elevating the lifting bars at one end of the elevator through the agency of other cables 206 which are connected to the cars 205 and to the transverse frame members 177, by which the lifting bars are connected, being passed around pulleys 207 located adjacent the corners of the car and mounted on shafts 208 carried by bearings secured to the frame members 163 and 196.

The channeled track members 170 of each elevator platform 63 are provided adjacent the opposite ends thereof with bumpers 215 which are adapted to permit the wheels of the automobile to pass thereover in one direction and to arrest the motion of the wheels in the other direction, so that when the elevator platform is elevated at one end, the automobile does not move from its position on the trackways 170 until the bumpers 215 adjacent the forward end of the car have been depressed. When the automobile passes onto the elevator platform the front wheels depress the bumpers at one end of the platform and, after the front wheels have engaged the bumpers at the other end of the platform, the bumpers adjacent the rear wheels rise into their normal positions and prevent the backward motion of the automobile. As shown particularly in Figs. 19 and 20, each bumper comprises a channeled plate 216 having side walls 217 which are pivoted on the side walls of the channel trackway 170 by means of pins 218. At the end thereof opposite the pins 218, the plate 216 is provided with a block 219 secured to the under side thereof by means of screws 220. This block is adapted to engage the slot in the trackway 170 when the bumper mechanism is depressed. The block 219 is provided on its under side with an inclined surface 221 adapted to be engaged by a flanged roller 222 mounted on a pin 223 carried by the lever 224 which extends downwardly through the

slot in the trackway and is pivoted at 225 on a bracket 226 secured to the under side of the trackway. A coil spring 227 connecting the lever with the bracket serves normally to maintain the roller 222 in its uppermost position with the lever 224 engaging a pin 230 projecting from the bracket. The lever 224 has an integral arm 231 projecting upwardly therefrom and having a cable 232 attached to the upper end thereof. This cable extends longitudinally of the elevator platform beneath the trackway 170 and after passing around a pulley 233 mounted on the bracket 234 carried by the frame of the elevator, it is connected to the underside of the platform at the other end thereof, so that when the opposite end of the platform is elevated, the cable 232 moves toward the left as viewed in Figs. 12 and 20, thereby depressing the roller 222 and permitting the block 219 to drop by gravity through the slot in the trackway 170 and allowing the plate 216 to move a horizontal position which will permit the automobile wheel to pass thereover, toward the right as viewed in Fig. 20. When the front wheel of the automobile is in its proper position on the platform, it is adapted to engage a supporting plate 235 which is provided with flanges 236 extending on opposite sides of the block 219 and pivotally connected thereto by means of a pin 237. The plate 235 has a flange 238 extending upwardly to be engaged by the automobile tire and, when this engagement occurs, the supporting plate is rocked about its pivot until the lower end thereof is brought into position above a detent 239 which is pivoted at 240 on a bracket 241 secured to the under side of the trackway. The detent 239 is supported normally in the position shown in Fig. 20 by a pin 242 engaging the under surface thereof, but when the plate 216 is depressed due to the movement of the cable 232, as previously described, the detent 239 is moved about its pivot by a cable 244 which connects the detent with a cable 232. The movement of the detent under the influence of the cable 244 is limited by a pin 245 projecting from the bracket 241 and when the detent is swung upwardly it passes out of alignment with the lower end of the supporting plate 235 so that the supporting plate is permitted to pass downwardly with the block 219 and the plate 216.

When there is no automobile on the elevator platform, the supporting block 235 is adapted to occupy the position illustrated by full lines in Fig. 20, it being adapted to assume this position by gravity and being limited in its motion on its pivot by a pin 246 which projects from the block 219 to engage the upper sides of the flanges 236. When in this position, the block 235 is adapted to pass downwardly through the slot in the trackway without interference with the detent 239 so that if an automobile passes onto the platform toward the left, as viewed in Fig. 20, the plate 216 of the bumper can be depressed by the weight of the automobile wheels passing thereover.

The entrance and exit openings of each elevator shaft, on each floor of the building, are provided with sectional fire-doors of any standard type which must be opened before the elevator platform can be raised at one end. These fire doors 250 are preferably motor operated and, before the operator elevates the loading platform to move the automobile therefrom, the circuit of the motor control for the fire door is closed and the door is opened thus permitting the automobile to roll from the loading platform onto the elevator platform. As the automobile passes onto the elevator platform, the front wheels engage the plates 235 at the ends of the bumpers 215 thus holding these bumpers in their elevated positions, as shown in Fig. 20, and preventing further forward movement of the automobile. As the automobile passes onto the elevator platform, both the front and rear wheels pass over the bumpers 215 at the other ends of the trackways 170 and the plates 216 of these bumpers rise up behind the rear wheels in order to prevent backward motion of the automobile. The operator, who assumes a position within the car on the runway 251, shown in Figs. 14 and 15, then closes the fire doors 250 on the first floor of the garage and operates the elevator controller 253, thereby setting in motion the lifting mechanism of the elevator car and raising it to the desired upper floor of the building. The lifting mechanism of the elevator car may be of any standard construction and is therefore not illustrated in detail. The upper floor to which the automobile is to be delivered will have been previously determined by the operation of the selector mechanism on the first floor, as hereinafter described. When the elevator reaches the upper floor of the garage, the operator manipulates the controller 253 to stop the elevator car and then opens one of the fire doors 250 opposite the upper floor. The full opening of the fire door is necessary to permit the actuation of the electric circuit by which the elevator platform 63 is elevated at one end. This electric circuit is shown diagrammatically in Fig. 18 where it is illustrated as comprising two line conductors 255 and 256, leading from the source of supply. The motor 188, mounted in the upper part of the elevator as shown in Fig. 12 is supplied with current through two conductors 257 and 258 which are connected to the line conductors 255 and 256 through a double throw reversing switch 260, the blades 261 of which are pivoted at the point 262. The upper end of one blade 261 is adapted to engage either of the contacts 263 or 264 connected to the conductor

257 and the adjacent end of the other blade 261 is adapted to engage either of the contacts 265 or 266 connected to the other conductor 258. The opposite end of the first mentioned blade 261 is adapted, in one position, to engage a contact 267 connected to a conductor 268 leading to the line conductor 255, and, in its other position, the lower end of this blade 261 is adapted to engage a contact 269 connected through a conductor 270 with the other line conductor 256. The lower end of the second switch blade 261 is adapted, when in one position, to engage a contact 271 connected to the conductor 270 when in one position, and to engage a contact 272 connected to the conductor 268 when in its other position. The shifting of the blades of the switch 260 is controlled by rods 273 pivotally connected to the blades of the switch and attached by insulating connections to the magnetizable cores 274 and 275 of the solenoids 276 and 277, respectively. One terminal of the solenoid 276 is connected through conductors 277ª and 278 with the line conductor 256, and a connection between the other line conductor 255 and the other terminal of the solenoid is adapted to be made through a branch conductor 280 having a conductor 281 leading therefrom through the fire door switch 282, the push button switch 283 and an upper limit switch 284. The push button switch 283 is located at the end of the elevator platform adjacent the fire door which has previously been opened so that the operator will necessarily be located adjacent the point where the automobile rolls from the elevator platform. The door switch 282 is mounted on the frame work of the elevator car in such a position that it is closed by the engagement therewith of the upper section of the fire door 250 when this section reaches its full open position, so that the complete opening of the fire door is necessary before the circuit of the motor 188 can be closed. After the switch 282 is closed by the opening of the fire door, the operator closes the push button switch 283, which is mounted on the side wall 165 of the elevator car as shown in Fig. 12. The upper limit switch 284, located in the conductor 281, is normally closed so that a circuit is then established through the solenoid 276. This actuation of the solenoid shifts the switch 260 to establish a circuit through the motor 188 which then operates and shifts the carriages 192 and 205 on the upper part of the elevator frame so that the left hand end of the elevator platform, as viewed in Fig. 12, is elevated. Simultaneously with the closing of the circuit through the solenoid 276, a circuit is also established through another solenoid 285 which is connected in parallel therewith. When the solenoid 285 is energized, its core 286 is moved toward the left as viewed in Fig. 18, carrying with it a conducting plate 287 which thereupon breaks contact with a terminal 288 and makes connection with another terminal 289 connected through a conductor 290 with the conductor 281, at a point between the switches 283 and 284. A conductor 291 leads from the plate 287 through a bottom limit switch 292, which automatically closes when the end of the platform begins to rise, to the branch conductor 280 previously described, so that the operation of the solenoid 285 establishes a shunt around the push button switch 283, making it unnecessary for the operator to maintain that switch in its closed position. The circuit being thus maintained through the solenoid 276, the motor 188 continues to operate to elevate one end of the platform 63 until the cross bar 117 connecting the lifting bars 175 at the left-hand side of the elevator car, as viewed in Fig. 12, engages the upper limit switch 284 and opens it. The opening of the switch 284 deenergizes the solenoid 285, and the plate 287 then moves toward its original position under the influence of the dash pot 293 which has its plunger 294 connected to the plate. The motion of the dash pot is comparatively slow so that sufficient time elapses to permit the automobile to roll from the inclined elevator platform before the plate 287 engages the contact 288 previously referred to. When the plate 287 engages the contact 288 a circuit is established from the conductor 280 through the lower limit switch 292 and the conductor 291 to the conductor 295 which is connected to one terminal of another upper limit switch 296, located at the other end of the elevator car. This upper limit switch 296 is connected in series with the door switch 297 and the push button switch 298 located at the left hand end of the elevator car, as viewed in Fig. 12, through a conductor 299 which leads from the conductor 280 to one terminal of another solenoid 300. A branch conductor 301 leads from the conductor 299 to one terminal of the solenoid 277, previously described, and the other terminal of solenoid 277 is connected in parallel with the solenoid 300 by a conductor 302 which is in turn connected with the other line conductor 256 by the conductors 303, and 278, so that both of the solenoids 277 and 300 are energized by the engagement of the plate 287 with the contact 288. The solenoid 277 then operates its core 275 to shift the blades of the switch 260 into the reverse position so that the motor 188 is then driven in the opposite direction and moves the carriages 192 and 205 in the reverse direction in the upper part of the elevator car so that the end of the platform 63 which has just been elevated is lowered again. When the left hand end of the elevator platform reaches its lower position, it closes the lower limit switch 292 and the electric circuits heretofore described are then in readiness for a

new operation of the elevator platform in the same manner.

If the operator desires to move the automobile from the elevator car in the opposite direction, the fire door 250 at the other end of the elevator platform is opened and when this fire door reaches its full open position it closes the door switch 297. The operator then manually closes the push button switch 298 which is normally open and which completes the circuit through the normally closed upper limit switch 296, the conductor 301, and the solenoid 277. When the solenoid 277 is energized, the switch 260 is shifted to close the circuit through the motor and cause it to rotate in the proper direction to lift the right hand end of the elevator platform, as viewed in Fig. 12. At the same time, the solenoid 300 is energized so that its core 304 moves the conducting plate 305 toward the left as viewed in Fig. 18, thereby moving that plate out of engagement with the contact 306 which is connected through a conductor 307 with the conductor 290, previously described. The plate 305 then engages a contact 308 connected to the conductor 295 and a circuit is thus established from the upper limit switch 296 through the conductor 295 and plate 305 to a conductor 309 which leads through the lower limit switch 310 and the branch conductor 280 to the other side of the line. The bottom limit switch 310 is automatically closed by the elevation of the right hand end of the elevator platform so that a shunt is thus established around the push button switch 298 and the motor 188 continues to operate without the operator maintaining the switch 298 in its closed position. When the right hand end of the elevator platform as viewed in Fig. 12 has reached the limit of its upward movement, the cross bar 177 at that end of the elevator engages the upper limit switch 296 and opens it so that the solenoids 277 and 300 are then deenergized. The plate 305 connected to the core of the solenoid 300 then moves slowly toward its original position under the influence of the dash pot 311 which has its plunger 312 connected to the plate. This movement of the dash pot is sufficiently slow to permit the automobile to roll from the inclined elevator platform while one end of the platform is in its uppermost position. When the plate 305 engages the contact 306 a circuit is established from the line conductor 255 through the conductor 280, lower limit switch 310, conductor 309, plate 305, contact 306, conductor 307, conductor 290, upper limit switch 284, solenoid 276, and conductors 277[a] and 278 to the other line conductor 256. The solenoid 276 being thus energized shifts the switch 260 to reverse the motor which then lowers the right hand end of the platform, as viewed in Fig. 12, until the circuit of the solenoid 276 is opened by the engagement of that end of the platform with the lower limit switch 310.

The upper limit switches 284, 296, and the lower limit switches 292, 310, which were referred to in the foregoing description as being embodied in the electrical circuit illustrated in Fig. 18 are all of substantially the same construction as are also the various upper and lower limit switches referred to in connection with the electrical circuits hereinafter described. One of these switches is shown in Fig. 13 where it is illustrated as comprising a casing 284[a] having an arm 284[b] projecting therefrom and pivoted at its inner end so that the part 284[c] thereof is adapted to make contact with a terminal 284[d] when the arm is in one position. The arm is held in its normal position by a spring 284[e] and when the arm is engaged by an adjacent element such as the frame of the elevator platform, the part 284[c] is swung out of engagement with the terminal 284[d] against the compression of the spring. When the elevator platform rises, the switch automatically closes. Various arrangements of this general construction may be employed to suit the needs of the particular electrical circuit in which the switch is used.

Whichever end of the elevator platform is raised, the inclination of the platform is adapted to depress the bumpers adjacent the lower end of the platform so that the automobile is permitted to roll from the elevator platform onto one of the storage platforms hereinafter described. This depression of the bumper mechanism is brought about by the cables 232 which rock the levers 224 downwardly in opposition to the springs 227 and at the same time move the detents 239 out of their positions beneath the supporting plates 235, thereby permitting the bumper plates 216 to drop by gravity about their pivots 218 while the blocks 219 and the plates 235 pass downwardly into the slots of the trackways 170. When the automobile has passed over the bumper mechanism and onto the storage platform the operator closes the fire doors and the elevator controller may then be operated to return the elevator car to the entrance floor or any other desired floor of the building.

When the automobile is discharged from the elevator car on an upper floor of the garage, it is received by a storage table 320. A number of these storage tables are provided, as shown in Fig. 3, one table being located on each side of each series or row of elevator shafts so that the automobiles may be discharged in either direction from each elevator shaft as heretofore explained. Each table 320 comprises two side frames each composed of a pair of channel beams 321 which are spaced apart with their flanges directed away from each other as shown particularly in Fig. 35. The side frame channels 321 at opposite sides of the frame are connected by the end frame members 322, which are also of channel form, as shown in Fig. 21, and each table also comprises a cen-

tral transverse frame member 323 made up of spaced channel bars 324. Each table is supported on a track extending transversely of the garage and comprising a pair of rails 325 which are partially embedded in the concrete 326 of the floor. The table is supported on the rails 325 of its track by means of flanged wheels 327 which are located between the channels 321 of the side frame members and mounted on shafts 328 which extend between the members 321 as shown in Fig. 35. The flanged wheels 327 are preferably mounted on the shafts 328 through roller bearings which are located in the enlarged hubs 329 of the wheels.

Each table 320 carries a series of storage racks 330 each comprising two parallel trackways 331 made up of angle bars 332 which are spaced apart to leave a slot between them as shown in Fig. 21. The opposite trackways 331 are connected together at one end of the rack by an angle bar 333 which extends downwardly on the outer side of the frame member 331, as shown in Fig. 35, and at the other side of the table the ends of the trackways 331 are connected together by an angle bar 334 which extends downwardly between the channels 321 of the side frame of the table. Between the ends of each rack, the channels of the opposite track members are connected by transverse frame member 335 and cross-bracing 336. The trackways 331 are spaced apart to correspond to the usual automobile tread and the various racks are so disposed on the table that each rack is capable of being brought into position opposite one of the elevator shafts by shifting the table 320 on the rails 325. The racks 330 are prevented from shifting laterally on the table 320 by means of angle clips 337 which are secured to the channels 321 of the side frames of the table.

The shifting of the tables 320 on their trackways in order to position the desired storage racks 330 opposite the elevator shafts is brought about by suitable motor operated mechanism which is controlled from the ground floor of the building. As shown in Fig. 21, each table 320 has a cable 340 connected to one end thereof and passed around a pulley 341 which is fixed on a shaft 342 journaled in bearings secured in the side wall of the building. The cable 340 then extends beneath the table and around another pulley 343 fixed on a shaft 344 which is journaled in bearings secured in a suitable recess in the opposite side wall of the building. After passing around the pulley 343, the cable 340 has its other end secured to the opposite end of the table 320. The shaft 344 is driven to operate the cable 340 by means of a V-grooved pulley 345 which is fixed on the shaft and adapted to be driven by an endless cable 346 which extends upwardly and around another V-grooved pulley 347 secured on the shaft 348. The shaft 348 is journaled in bearings secured in a recess of the side wall and has another V-grooved pulley 349 thereon adapted to be driven by an endless cable 350 which in turn is driven by the V-grooved pulley 351 mounted on the secondary shaft 352 of a speed reducer 353. The primary shaft 354 of the speed reducer is driven by an electric motor 355, both the motor and the speed reducer being mounted on the elevated platform 356.

As previously indicated, the various motors 355 and the mechanism connected thereto for shifting the tables 320 are operated by electrical apparatus which is controlled from the ground or entrance floor of the garage so that when a customer enters the garage with his automobile the precise storage rack in which his automobile is to be placed on an upper floor of the building can be positioned opposite that elevator shaft into which the automobile is to pass from the ground floor. For this purpose there is provided adjacent each loading platform on the ground floor an instrument board 360 carried on a supporting frame 361, as shown particularly in Figs. 22 and 23. Each instrument board 360 is provided with a positioning dial 362 having a plurality of apertures 363 formed therethrough, the number of such apertures corresponding to the number of storage racks on the upper floor which are adapted to receive automobiles from the elevator shaft adjacent the positioning dial in question. These apertures 363 are preferably arranged in two circles as shown in Fig. 22, the apertures associated with the storage racks on the various floors being indicated by the words "1st floor", and "2nd floor", etc. around the outer portion of the dial as shown at 364. The apertures relating to the various storage racks on each floor are numbered so that a definite storage rack on a particular floor may be located on the dial. A disk 365 is mounted behind the dial 362 and this disk is provided with a hub 366 in which is journaled the shaft 367 of a rotatable arm 368 adapted to travel over the face of the dial. This rotatable arm has a lever 369 pivoted thereon and provided at its opposite end with a slot engaged by a punch member 370 which slidably engages a hole in the arm 368 and which has a coil spring 371 mounted thereon between the arm and the lever so that the punch member is normally caused to assume its outer position. The inner end of the punch member is enlarged in order to limit its outward movement. Another lever 372 is pivoted on the arm 368 with its free end directed opposite to that of the lever 369 and the lever 372 is similarly provided with a forked extremity adapted to be engaged by another punch member 373 which slidably engages another aperture in the opposite end of the arm 368 and which has a coil spring 374 mounted

thereon to hold the lever 372 normally in its outer position. One of the punch members 370 is adapted to engage the apertures 363 in the outer row while the other punch member 373 is adapted to engage the apertures 363 in the inner circle.

A spider 375 is mounted behind the disk 365 and both of these members with the dial 362 are mounted in a circular drum 376 which is carried by the frame 361 as shown particularly in Fig. 23. The disk 365 and the spider 375 serve as supports for a plurality of tubular switches 380 which are also arranged in circles, one of these switches being located opposite each of the apertures 363 in the dial. When the customer enters the ground floor of the garage with his automobile, the attendant inserts one of the punches 370 or 373 through one of the apertures 363, corresponding to the storage rack in which the automobile is to be stored, and upon pushing the punch member through the dial, the appropriate tubular switch 380 is operated to set in motion the mechanism by which the desired storage rack is positioned opposite the proper elevator shaft on an upper floor of the garage.

A dial 377 like the dial 362 is mounted on a suitable frame or instruments board 378 adjacent the discharge side of each elevator shaft on the ground floor as shown in Fig. 2, and when a customer takes his car from the garage it is necessary that he or the attendant insert one of the punches through an aperture in the dial at the discharge side of the elevator in order to set in motion the apparatus by which the automobile is returned to the ground floor of the garage from the upper storage floor. The dials 377 which are located at the discharge sides of the elevators are exactly like the dials 362 illustrated in Fig. 22, but these discharge dials are provided with tubular switches 381 which are somewhat different in construction than the switches 380 operated by the positioning dials 362 adjacent to the entrances of the elevators.

As shown particularly in Figs. 24 and 25, the tubular switches 380 of the positioning dials comprise metal tubes 383, each having mounted therein a plunger 384 which is normally maintained in its forward position by means of a coil spring 385 engaging the annular flange 386 of the plunger at one end and co-acting at its other end with the collar 387 which is fixed in the tube 383. The forward motion of the plunger is limited by a nut 388 which threadedly engages the plunger and co-acts with the rear side of the collar 387. The forward end of the plunger 384 has an insulating bushing 391 mounted thereon and held in place by a cap screw 392, the head of which is adapted to be engaged by one of the punches 370 or 373 when the latter is inserted through the dial 362. The insulating bushing 391 is provided with an annular recess to receive a metallic sleeve 393 which has its outer surface flush with the outer surface of the bushing so that when the plunger is pushed inwardly against the compression of the spring 385, the metal sleeve 393 engages and forms an electric connection between the spring contact members 394 which are secured in position on insulating bushings 395 passing through the disk 365 by means of bolts 396 and nuts 397. The contacts 394 are connected in the electrical circuit as hereinafter described. The plunger 384 is provided with an extension 398 which extends rearwardly and engages a groove in a block 399 which is secured in fixed position within the tube 383 beneath an opening 400 which is formed in the upper side of the tube. A detent 401 is pivoted on the block 399 by pins 402 and the head of this detent is provided with a shoulder 403 adapted to drop down opposite the end of the extension 398 of the plunger when the detent is in its horizontal position. The detent is, however, normally held in an upwardly inclined position, as shown by dotted lines in Fig. 24, by means of another plunger 404 which engages the inclined face 405 of the detent. The plunger 404 is formed of magnetizable material and it forms the core of a solenoid 406 which is secured in fixed position in the tube 383 rearwardly of a fixed collar 407 provided with an aperture 408 through which the forward end of the plunger 404 extends. The solenoid 406 is provided with terminals 409 which extend outwardly through suitable apertures in the tube 383 for connection with the electrical circuit hereinafter described. The rear end of the plunger 404 is provided with a circular head 410 having a sheet of insulating material 411 secured thereon and adapted to contact with a spring switch blade 412 which, when depressed contacts with another spring switch blade 413. These switch blades are secured in position on the insulating block 414, which closes the rear end of the tube 383, by means of the contact terminals 415 adapted to be connected in the electric circuit hereinafter described.

The tubular switch members 381, which are mounted behind the dials 377 at the exit sides of the elevator shafts, are of the form illustrated particularly in Fig. 26. Each device 381 comprises a tube 420 which threadedly engages one of the disks 365. Each tube 420 has a plunger 421 mounted therein and held normally in its forward position by a coil spring 422 engaging at its forward end the annular flange 423 formed on the plunger and contacting at its rear end with a collar 424 which is mounted in fixed position in the tube. The forward motion of the plunger is limited by the nut 425 which is adapted to contact with the rear side of the collar. The forward portion of the plunger, which projects normally beyond the disk 365, is provided with an insulating bushing 426 which is secured in place by a cap screw 427 adapted

to be engaged by the plunger 370 or 373 inserted through the registering hole in the dial. The bushing 426 is recessed on its outer surface to receive a metallic sleeve 428 which has its outer surface lying flush with the outer surface of the bushing so that when the plunger is forced inwardly against the compression of the spring 422, the sleeve 428 is adapted to form a connection between the spring contact members 430 which are secured in position on the insulating bushings 431, engaging apertures in the disk 365, by means of the terminal bolts 432 and the nuts 433. The end of the plunger 421 which projects through the fixed collar 424 is secured to an insulating block 435 by means of a transverse pin 436, and this insulating block has a metallic contact blade 437 projecting from the rear end thereof and secured in place by a transverse screw 438. When the plunger is pushed rearwardly, the blade 437 is adapted to enter a slot 439 formed in an insulating block 440 which is mounted in the rear end of the tube 420. A pair of spring contact blades 441 are mounted in the slot 439 to be connected by the blade 437 and the spring members 441 are secured in place on the insulating member 440 by means of the contact terminal bolts 442 which are adapted to be connected in the electrical circuit as hereinafter described.

On the ground floor adjacent each elevator shaft there is located one of the frames 361 and its panel 360 supporting one of the dials 362 provided with punching apertures 363 and tube switches 380 for controlling the positioning movements of all of the storage racks on the upper floors which are to receive automobiles from the adjacent elevator shaft. The positions of the dials 362 are indicated in Figs. 1 and 2. When an automobile passes onto the loading platform adjacent one of the elevator shafts, the operator determines the storage rack in which the automobile is to be placed by inspection of an enunciator board 450 which is mounted preferably above the dial 362 as shown in Fig. 22. This enunciator board is provided with a plurality of small electric lights 451, one for each storage rack adapted to receive an automobile from the adjacent elevator shaft on the upper floors of the garage and these lights are arranged in rows corresponding to the various floors of the garage building. When a particular storage rack on an upper floor is empty, the light 451 related thereto is adapted to show green and when the rack is occupied by an automobile the light shows red, as hereinafter more fully explained. Having selected a storage rack on a particular floor of the building, the operator moves one of the punches 370 or 373 to the corresponding punching aperture on the dial 362 and the punch is then pushed through the aperture to actuate the adjacent tubular switch 380. When the forward end of this switch is engaged by the punch, the plunger 384 is moved inwardly so that the contacts 394 are connected by the sleeve 393, thereby actuating an electric circuit for controlling the operation of the motor 355 for shifting the appropriate storage table on an upper floor of the garage. This electric circuit is illustrated diagrammatically in Fig. 27 where it is shown as being supplied with electrical energy through line conductors 453 and 454 having a main double pole switch 455 connected therein. One of these line wires 453 is carried across the controller board 456 and leads therefrom to one of the contacts 394. When the contacts 394 are connected by the sleeve 393, the conductor 453 is connected to another conductor 457 which leads back to the controller board 456 where it passes through a contact plate 458 and thence to one terminal of a solenoid 459. From the other terminal of the solenoid 459 a conductor 460 leads to a terminal 461 of a position selector 462 which determines the extent of movement of the storage table by the motor 355. From the contact 461 a circuit is established through a conductor 463 to another contact 464 having connection with a movable arm 465 which normally engages another contact 466 so that the circuit is completed through the selector to a conductor 467 which leads to one terminal of a solenoid 468. Another conductor 469 leads from another contact 470 of the selector to one terminal of another solenoid 470. The opposite terminals of the two solenoids 468 and 470 are connected through a conductor 471 to the other line wire 454 so that a complete circuit is established and the solenoid 468 operates through its core to shift the blades of a double pole, double throw switch 472 which is adapted to establish a connection between the line wires 453 and 454 and the wires 473 and 474 which lead to the terminals of the electric motor 355 by which the storage table is shifted. As shown in Fig. 27, the blades of the switch 472 are in their neutral position. When shifted in one direction by the solenoid 468, the blades of the switch establish a connection which operates the motor 355 in one direction of rotation and when the blades are shifted in the other direction by the solenoid 470, the connections of the motor are reversed so that it operates in the opposite direction. When the solenoid 459 is actuated, it moves a blade 476 into contact with the plate 458, and, since the blade 476 is connected by a conductor 477 to the line wire 453, a shunt circuit is thus formed around the contacts 394 of the tube switch 380 so that the operator can release the punch 370 and permit the plunger 384 of the switch 380 to return to its normal position under the influence of the spring 385. The circuit being thus established to operate the motor 355, the motor continues to run as long as the arm 465 maintains its connection with the contact or ter-

minal 466 of the selector and the time of this connection is determined by the extent of movement of the storage table which is necessary to bring the storage rack which has previously been selected into a position opposite the elevator shaft in which the automobile is to be raised to the storage floor.

The selector 462 which determines the period of running of the motor 355 is represented diagrammatically in Fig. 27 and is shown more fully in Figs. 30 and 31 where it is represented as comprising a plurality of disks 480 which are fixed on a main shaft 481 and adapted to be engaged on their periphery surfaces by a series of shoes 482. Each shoe is connected to an arm 465, these arms corresponding to the arm 465 shown in Fig. 27. The arms are pivoted at their middle points on posts 483 and when the shoes are elevated by engagement with the disks 480, the upper ends of the arms are adapted to engage the contacts 466, 470, and the like, which are arranged in series along the top of the insulating plate 486. Electric connections are made with the arms 465, corresponding to the contacts 461 and 463 shown in Fig. 27, and the arms have springs 487 connected thereto and to the board 486 so that the springs tend normally to move the upper ends of the arms out of engagement with the contacts 466 and 470. The peripheries of the disks 480 have portions thereof cut away, as shown in Fig. 30, so that after a predetermined rotation of the shaft 481, each shoe 482 is adapted to drop out of engagement with its disk into the recess formed therein, thereby permitting the connection of the adjacent arm 465 with its contact 466 to be broken so that the circuit of the solenoid 468 or 470 is broken and the operation of the motor is arrested. In Fig. 27, the connections have been shown for positioning one storage rack by the operation of two of the tube switches 380 and 381, but it will be understood that each selector 462 contains all the disks and contacts for positioning each of the storage racks on any one storage table, although the circuits of the other disks and contacts are not completed in the drawing. The position selector 462 is preferably driven by the storage table which is to be shifted. For this purpose a gear 488 is fixed on the shaft 481 and driven by a pinion 489 mounted on the countershaft 490. A drum 491 is also secured on the shaft 490 and this drum has a cable 492 passed around it with the end portions thereof extending in opposite directions and connected to the table as shown in Fig. 29, the selector 462 being located between the ends of the table so that when the table is shifted in either direction by the operation of the motor, the cable 492 rotates the drum 491 and thereby operates the selector. Each disk 480 of the selector is adapted to position a certain storage rack opposite each elevator shaft on one storage floor of the building, and when the storage rack which has been selected is in a position opposite the desired elevator shaft, the shoe 482 drops from the periphery of the related disk 480 of the selector and arrests the operation of the motor. When this occurs the worm drive of the speed reduced operates as a brake to bring the table immediately to rest. Having positioned the selected storage rack opposite the elevator shaft, the rack is in readiness to receive the automobile from the elevator platform which is accomplished by elevating one end of the elevator platform in the manner hereinbefore described.

During the time that this automobile is in storage the table on which it is supported may be shifted any number of times in order to bring other storage racks into position opposite the same or other elevator shafts so that when the owner desires to take his automobile out of the garage it is necessary to bring the storage rack into position opposite the elevator shaft before the automobile can be moved onto the elevator platform. This is accomplished by operating the punch through the proper punching aperture in the dial 377 which is located on the exit side of the elevator shaft on the ground floor of the building, thereby operating one of the tube switches 381 which have previously been described. When the operator actuates the switch 381, the contacts 430 are connected by the sleeve 428 as the plunger 421 moves inwardly. One of the contacts 430 is connected through a branch conductor 453[a] to the line wire 453, as shown in Fig. 27, and the other contact 430 is connected through a conductor 457[a] to the conductor 457, previously described, so that the actuation of the switch 381 again establishes a circuit through the solenoid 459, thereby closing the switch blade 476 to permit the operator to release the punch, and establishing a circuit through the selector 462 to the solenoid 470 which then closes the switch 472 to move the table and position the proper storage rack opposite the desired elevator. When the table is moved sufficiently, the selector again opens the circuit of the solenoid 470 and the motion of the table is arrested.

At the same time that the switch 381 closes the circuits of the solenoids 459 and 470, the blade 437 mounted on the insulating block 435 at the inner end of the switch plunger, connects the contacts 441 thus establishing a connection between the terminals 442 which are connected to the conductors 495 and 496. The conductor 495 leads to one terminal of a battery 497 and the other terminal of this battery is connected by a conductor 498 to one terminal of the solenoid 406 which is embodied in the switch 380 connected in the circuit for positioning the same storage rack. The other terminal of the solenoid 406 is

connected by a conductor 499 to the other conductor 496 which leads from the switch 381. The other terminal of the battery 497, to which the conductor 495 is connected, has a conductor 500 leading therefrom to one of the terminals 415 at the inner end of the switch 380. The other terminal 415 has a conductor 501 leading therefrom and this conductor, with the conductors 496 and a branch conductor 502, leading from the conductor 498, is carried to a controller 503 for the lighting circuit of the enunciator board 450 shown in Fig. 22. The conductor 496 is connected to one terminal of a solenoid 504, forming a part of the controller 503, and the conductor 502 is connected to the other terminal thereof. The conductor 501 is connected to one terminal of another solenoid 505 and the other terminal of that solenoid is connected to the conductor 502. When the operator originally actuates the switch 380 to move the storage rack in preparation to receive an automobile, the core 404 of the solenoid 406 is pushed inwardly by the extension of the plunger to close the contact blades 412 and 413, thereby establishing a connection between the conductors 500 and 501 so that the solenoid 505 is then actuated to trip a pivoted detent 506 which then releases a pivoted switch lever 507 by which the lighting circuit is controlled. This serves to actuate the red light 451 on the enunciator board 450 to indicate that the related storage rack is occupied or in use. This indication of the red light continues on the enunciator board until the subsequent operation of the related switch 381 when the automobile is taken from the garage and when this occurs, the connection of the conductors 495 and 496 establishes a circuit through the solenoid 406 of the switch 380 so that the core 404 of the solenoid is restored to its normal position. At the same time a circuit is established through the solenoid 504 of the controller 503 which then operates the lever 507 in the reverse direction so that the red light is extinguished and the green light revealed on the enunciator board 450. During the time that the core 404 of the solenoid 406 was in its rearward position, as shown in Fig. 24, a second operation of the switch 380 was prevented by the dog 401 which was permitted to drop into the position shown by full lines in Fig. 24, so that the shoulder 403 thereof would engage the end of the plunger extension 398 and prevent the operation of the switch. However, when the solenoid 406 is subsequently actuated by the operation of the switch 381, the end of the core 404 engages the inclined face 405 of the dog and returns it to the inclined position shown by dotted lines in Fig. 24, so that the switch 380 is then in readiness for a subsequent operation in accordance with the indication of the green light on the enunciator board 450.

The foregoing description sets forth the operation of the apparatus by which the storage rack containing the automobile to be withdrawn from the garage is positioned opposite the proper elevator shaft on the upper floor of the garage. After the attendant has operated the tube switch 381 on the ground floor to set in operation the positioning apparatus, he rides up in the elevator car to the upper floor on which the automobile is stored and, by the time he arrives, the proper storage rack will have been located opposite the elevator shaft. The automobile is then returned from the storage rack to the elevator platform by elevating one end of the storage rack 330, by means of mechanism which is illustrated particularly in Figs. 32 to 39, inclusive. This mechanism comprises vertically moving lifting cars 510, one of which is located opposite each elevator shaft for operating certain racks on one storage table. Each car 510 comprises a frame 511 having four flanged wheels 512 mounted thereon and adapted to travel between the flanges of two oppositely disposed channels 513 which are mounted vertically at the end of the storage rack opposite the elevator shaft. The frame of the car 510 has an angle bar 514 secured to the lower end thereof with its flange directed outwardly to underlie the angle bar 333 secured to the under side of the storage rack, as shown particularly in Fig. 33. When the car 510 is elevated, the angle bar 514 lifts one end of the storage rack and the opposite end of the storage rack is prevented from moving longitudinally by the angle bar 334 which extends downwardly between the frame members 321 at the opposite side of the storage table 320. The lifting car 510 is moved vertically by means of a cable 515 which is secured to the upper end thereof and which is wound around a drum 516 rotatably mounted on a horizontal shaft 517. The shaft 517 is journaled in bearings carried by the side walls and by the vertical channel members 513 and is driven by a sprocket chain 518 passing around the sprocket gear 519, secured to the end of the shaft, and around another sprocket gear 520 which is secured to the secondary shaft 521 of the speed reducer 522 which comprises a worm wheel and a worm driven by the shaft of an electric motor 523. The motor and the speed reducer are mounted on a platform 524 located adjacent the ceiling, as shown in Fig. 35, so that they do not interfere with the movements of the storage table with automobiles located thereon. The shaft 517 operates the winding drums 516 through clutch members 525 which are splined on the shaft and adapted to be moved longitudinally to bring their teeth into engagement with the similar clutch teeth

on the hubs 516[a] of the winding drums. Each clutch member 525 is provided with an annular groove 526 engaged by a shifting lever 527 which is pivoted at one end on a bracket 528 carried by one of the vertical channels 513. A coil spring 529 connects the opposite end of the lever 527 with the frame member 530 and operates normally to keep the clutch teeth out of engagement. The lever is shifted in the other direction to throw the clutch teeth into engagement by means of a wire 532 which extends longitudinally in a pipe 533. The wires for the several clutches mounted on the same shaft 517 are located in pipes 533 which are arranged in groups extending horizontally adjacent to the shaft 517 and these wires are operated by mechanism mounted adjacent the side wall of the garage, as shown particularly in Figs. 35, 36 and 38. Each wire 532 is connected at its end to a bar 534 which is adapted to move longitudinally between oppositely disposed rollers 535 mounted on the frame member 536. A hook member 537 is pivotally connected to the end of the bar 534 and any one of the group of hook members 537 may be elevated to engage one arm 538[a] of a bell crank lever 538 which is pivoted at 539 on the frame member 540. When one of the hook members 537 is elevated by mechanism to be hereinafter described, the wire 532 which operates the connected clutch member is moved longitudinally by the arm 538[b] of the bell crank lever 538 about its pivot. This movement of the lever 538 is effected by the connection of a cable 541 with the arm 538[b] thereof. This cable extends vertically and is wound around a drum 542 with its end secured thereto. This drum 542 is fixed on a shaft 543 which is journaled in a bracket 544 projecting from the casing of an electric motor 545. A gear 546 is also secured on the shaft 543 and this gear meshes with a pinion 547 fixed on the shaft of the motor so that when the motor is operated it causes an upward pull to be exerted on the cable 541. The series of hook members 537 which are mounted side by side adjacent the bell crank lever 538 are adapted to be elevated independent of each other by a series of levers 550 which are pivoted on a common axis 551 and provided with depending arms 552 carrying rollers 553 which are adapted to underlie the several hook members so that these members are lifted when the levers 550 are elevated. The levers 550 are operated by a series of cables 554 which extend vertically, each one being connected to a core 555 of a solenoid 556. These solenoids are mounted in insulating casings 557 located on the face of the insulating board 558 and the upper end of each core 555 is pivotally connected to a lever 559 pivoted at one end of a bracket 560 carried by the casing of the solenoid. The levers 559 have rollers 561 mounted on their inner ends to co-act with the curved outer faces of the contact levers 562 which are pivoted on the board 558. Each contact lever 562 is adapted to rock upwardly to engage a pair of terminals 563 and 564, as shown particularly in Figs. 37 and 38, thereby closing electric circuits as hereinafter described.

The electric circuits by which the motors 523 and 545 are operated are illustrated diagrammatically in Fig. 39. These circuits are supplied through line wires 570 and 571 which have a double pole switch 572 connected therein so that the entire circuit may be thrown out of operation if desired. The apparatus for elevating the storage rack is set in operation by the closing of a manually operated switch 573 which is located preferably adjacent to the elevator shaft and which is held in closed position by the operator while the automobile is being transferred from the storage rack to the elevator platform. When the switch 573 is closed, a connection is established from the line wire 571 through a conductor 574 to another conductor 575 which leads to one terminal of one of the solenoids 556 and the other terminal of this solenoid is connected to a conductor 576 which leads to the other line wire 570 so that a circuit is thus completed through the solenoid 556 causing the core 555 to move upwardly and move the contact lever 562 into engagement with the terminals 563 and 564, while at the same time moving one of the hook members 537 into engagement with the lever 538. A connection is thus established between the conductor 577 and another conductor 578 leading to one terminal of another solenoid 579 which has its other terminal connected to the wire 576 having connection with the opposite line wire 570. The actuation of the solenoid 556, previously referred to, will have elevated one of the hook members 537 to bring it into engagement with the bell crank lever 538 and, when the solenoid 579 is energized by the connection of the terminals 563 and 564, a contact lever or armature 580 is moved to connect the terminals 581 and 582. The lever 580 is connected by conductor 583 with one line wire 571 and when this lever engages the contact 582, a circuit is completed through the conductor 584, the series field 585 of the torque motor 545, and from the motor through the conductor 586 to the other line wire 570. The torque motor 545 then operates to wind up the cable and rock the bell crank lever 538 about its pivot, thus shifting longitudinally the wire 532 which operates the clutch 525 located opposite the elevator shaft into which the automobile is to be discharged from the storage rack.

The line wire 570 terminates in two branches 570[a] having terminals 587 and 588. The other line wire 571 terminates in two branches 571[a] having terminals 589 and 590.

The two terminals 587 and 589 are adapted to be connected to the contacts 591 and 592, respectively, which are mounted on an insulating member 593 carried by the core 594 of a solenoid 595. The other two contacts 588 and 590, leading from the two line wires 570 and 571, respectively, are adapted to be connected with the contacts 596 and 597, respectively, which are mounted on the insulating member 598 carried by the core 599 of another solenoid 600. The contact 592 is connected by a conductor 601 with the contact 596 and the contact 591 is connected by a conductor 602 with the contact 597. It will be apparent, therefore, that when the core 599 of the solenoid 600 is moved upwardly, the terminals of the motor 523 will be connected to the line wires 570 and 571 to cause the motor 523 to be driven in one direction and when the core 594 of the other solenoid 595 is moved upwardly, the circuit connections of the motor 523 are reversed so that it rotates in the opposite direction. The cores 594 and 599 are connected through a pivoted arm 603 so that one of the cores is necessarily in its lowered position when the other one is elevated. When the solenoid 579 is energized to establish a circuit through the motor 545 and thereby throw in the appropriate clutch 525 on the shaft 517, through the mechanical connections heretofore described, another circuit is at the same time established from the armature 580 of the solenoid 579 through the conductors 604 and 605 leading to one terminal of the solenoid 600. The other terminal of this solenoid 600 is connected through conductor 606, 607, 608 and the limit switches 609, 610, and 611 to the other line wire 570, so that when the motor 545 is actuated to throw in the clutch, the solenoid 600 is operated to bring the contacts 596 and 597 into engagement with the contacts 588 and 590 respectively, thereby actuating the motor 523 and causing one end of the storage rack 330 to be elevated by the mechanism heretofore described. As soon as the end of the storage rack begins to rise, it permits a lower limit switch 613 to close. This switch is mounted between the vertical channels 513, as shown particularly in Fig. 33, and the arm of the switch is engaged by the storage rack when it is in its horizontal position so that the switch is normally open. When the arm of the switch is released by the raising of the table, the switch automatically closes and thus establishes a shunt circuit around the manually operated switch 573, this circuit being formed through the conductors 614 and 615 and the arm 563 which is controlled by the solenoid 556. The operator may then release the switch 573 and the apparatus will continue to operate in elevating the storage rack.

The solenoid 595 for reversing the direction of the motor 523 is connected to one line wire 570 through a conductor 616 and the other terminal of this solenoid is connected through conductor 617 to the contact 618. Another contact 619, located adjacent the contact 618, is connected to the conductors 604 and 605, previously described, so that the circuit of the solenoid 595 for reversing the motor 523 can be established only by the connection of the contacts 618 and 619 through a contact plate 620 which is operated by the core 621 of a relay 622. This relay has one terminal connected by a conductor 623 with the conductor 578, which is connected to the line wire 571 by the operation of the solenoid 556 and the closing of the lower limit switch 613, as previously explained, so that when the conductor 578 is connected to the line 571, a circuit is established through the relay 622 which has its other terminal connected through a conductor 624, and the conductor 607, previously described, to the other line wire 570. The relay 622 is thus actuated when the motors 545 and 523 are set in operation and the connecting plate 620 is elevated so that a circuit cannot be established through the reversing solenoid 595 while the end of the storage rack is being elevated. The elevation of the storage rack continues until the end of the rack engages and opens one of the upper limit switches 609, 610 or 611, one of which is provided for each storage rack. These limit switches are mounted adjacent the vertical channels 513, as shown in Fig. 35 and when one of them is opened by the engagement therewith of the end of the storage rack 330, the circuit from the line wire 570 through the conductors 607 and 608 and the relay 622 is broken, and at the same time the circuit of the solenoid 600 is opened, thus arresting the operation of the motor 523 and permitting the contact plate 620 to be lowered through the operation of the dash pot 625. The movement of the plate 620 by the dash pot 625 is sufficiently slow to permit the automobile to roll from the inclined storage rack before the plate 620 engages the contacts 618 and 619, at which time the circuit is completed through the solenoid 595 so that the contacts 591 and 592 are elevated to engage the contacts 587 and 589, respectively, thereby reversing the motor 523 and starting the storage rack on its downward movement. When the contacts 591 and 592 are elevated, the plate 593 on which they are mounted, carries with it another contact 626 which is moved out of engagement with a contact 627, thus breaking the circuit between the conductors 607 and 608, which prevents the formation of a circuit through the solenoid 600 while the solenoid 595 is in operation to cause the motor 523 to rotate in the reverse direction. The lowering of the storage rack by the motor 523 is continued until the rack engages the lower limit switch 613, whereupon the solenoids 556 and 579 are de-

energized, thereby opening the circuit of the solenoid 595 and arresting the operation of both the motors 523 and 545. The apparatus is then at rest and in readiness for a succeeding operation.

The movements of the automobiles onto the storage racks 330 are controlled by bumpers as shown particularly in Fig. 33. A stationary bumper 630 is mounted between each pair of track members 331, adjacent the ends thereof which are to be elevated, so that when the automobile first passes onto the storage rack from the elevator platform, its wheels engage the bumper 630 and the automobile is brought to rest. As the automobile passes onto the storage rack, the wheels thereof pass over a pivoted bumper 215 of the same form as those which were described as being mounted on the platforms of the elevators. After the wheels have passed over these bumpers, they are automatically elevated by the springs 227 so that the plates 235 thereof are adapted to engage the rear wheels of the automobile to prevent the return movement thereof toward the elevator shaft. When the storage rack 330 is elevated as shown in Fig. 33, the bumpers 215 are depressed through the operation of the cables 232 which are stretched taut when the storage rack reaches the upper limit of its movement. The automobile is then permitted to roll by gravity from the storage rack during the period which is provided for the reversal of the motor 523. After passing onto the elevator platform from the storage rack, the elevator car is lowered to the ground floor in the manner heretofore described, and after opening the doors of the elevator shaft on the ground floor, the operator is ready to discharge the automobile on the exit side of the elevator shaft by elevating one end of the elevator platform 63. This is done by pressing the proper one of the buttons 283 which control the electric circuits for operating the motor 188 by which the raising of the ends of the elevator platform is effected.

As the automobile rolls from the elevator platform the wheels pass into a pair of parallel trackways 650 which lead to the exit door of the garage. Each trackway 650 is formed by a pair of angle bars 651 which are spaced apart to leave a longitudinal slot 652 between them. Adjacent the elevator shaft, the floor is provided with a chamber 653, located beneath and between the trackways 650, and this chamber is closed by a plate 654 extending between the trackways and supported thereon by angle bars 655. Since the driver ordinarily starts the engine of his automobile while it is supported over the chamber 653, thereby creating a quantity of objectionable gases and fumes, provision is made for exhausting these gases and fumes through the chamber 653 by providing a series of holes 656 in the plate 654 and connecting suitable suction apparatus to the interior of the chamber.

As the automobile rolls onto the trackways 650, it is brought to rest by bumper mechanism 70 which is automatically actuated by the wheels of the automobile, and which is illustrated particularly in Figs. 40 to 43, inclusive. This bumper mechanism is supported chiefly by a series of transverse channels 658 which extend transversely of the chamber 653 with their ends united by the longitudinal channels 659 which are mounted at the sides of the chamber. These transverse channels 658 support the depending hangers 660 which have rollers 661 projecting laterally therefrom, as shown in Fig. 41, to receive two longitudinal trip rods 662 between them. At their rear ends these rods are rigidly connected by a channel plate 663, the upper surface of which is adapted to be engaged by a roller 664 mounted on one arm of a bell crank lever 665. This lever is pivoted at 666 on one of the frame members 660 and the other arm of the lever is adapted to support a weight 667 which may be adjusted longitudinally thereon in order to vary the pressure with which the roller 664 engages the plate 663. This construction regulates the motion of the longitudinal trip rods 662 and causes them to come to rest promptly after being actuated in the manner hereinafter described. At the ends thereof near the elevator shaft the rods 662 are connected by a transverse pin 669 which is adapted to be engaged by the depending arm 670^a of a trip lever 670 which has its other arm projecting upwardly through the slots 652 of one of the trackways 650. The lever 670 is pivoted at 671 beneath the trackway and is provided at the end of its upper arm with a plate 670^b which is adapted to be engaged by the tire of the front wheel of the automobile as it passes onto the trackway. The lever 670 is rocked downwardly, in opposition to a spring 672, as the wheel passes thereover, thus causing the trip rod 662 to be moved toward the left, as viewed in Fig. 41, to the intermediate position illustrated by dotted lines at 673. The trip rods 662 are connected between their ends by an angle plate 674 which, when the trip rods are moved longitudinally by the tripping of the lever 670, assumes the position shown by dotted lines at 675. At the same time two other pins 676 and 677 which connect the rods 662, are moved to the positions shown by dotted lines at 678 and 679, respectively. As the automobile continues to move along the trackways 650, one front wheel engages another trip lever 680 which is pivoted at 681 beneath the trackway and which is provided with a plate 682 on the upwardly projecting arm thereof to co-act with the automobile tire. This lever is normally held in its upper position by a coil spring 683 which connects the depending arm 680^a with

a fixed plate 684 located on the under side of the trackway. As this lever 680 is depressed by the passing of the front wheel of the automobile thereover, the depending arm 680[a] engages the pin 676, which has previously been positioned at 678, and thereby moves the trip rods 662 to the extreme position illustrated by dotted lines at 685 in Fig. 41. As the trip rods move to their extreme forward position, the angle plate 674, which has previously been moved to the position 675, engages and rotates a lever 686 which is pivoted on a depending frame member 687. This lever is connected through a longitudinal rod 688 with the operating lever 689 of a valve 690 which controls the flow of compressed air through a pipe 691 to a cylinder 692 suspended between the transverse angle bars 693 which are supported by longitudinal frame members 694, located midway between the sides of the chamber 653 and secured to the transverse frame members 658. When the compressed air is admitted to the cylinder 692, the piston therein moves the piston rod 695 longitudinally and operates a cable 696 which passes over a grooved pulley 697 mounted on a shaft 698 which is journaled in bearings 699 carried by the frame members 694. The opposite end of the cable 696 is connected to the lower end of a lever 700 which has its upper end fixed on the transverse shaft 701 journaled in bearings 702. The ends of the shaft 701 have arms 703 fixed thereon beneath the trackways 650 and these arms are pivotally connected at their other ends to the channels 704 which are adapted to pass upwardly through the slots 652 in the trackways. The upper ends of the bars 704 are pivotally connected to brackets carried by the bumper plates 705 which are of channel form and which have their ends pivoted at 706 on the side walls of the trackways 650. The bumper plates 705 are normally held in their lower horizontal positions, as shown by full lines in Fig. 41, by means of coil springs 707 which are connected to the clips 708 attached to the lower ends of the bars 704 and to the lower ends of the channels 709 which extend downwardly from one end of the frame members 658 beneath each of the trackways. When the cable 696 is operated by the cylinders 692, as previously described, the channels 704 are moved upwardly through the slots in the trackways in opposition to the springs 707, thereby elevating the bumper plates 705 and bringing them into the position illustrated by dotted lines in Fig. 41, where they engage the tires of the rear wheels of the automobile and bring it to rest. The automobile is then in readiness for the driver to enter and take his position at the steering wheel and, while he is doing this, the compressed air in the cylinder 692 leaks out through a bleed opening 710 so that the bumper plates 705 are gradually returned to their horizontal positions as the springs 707 overcome the air pressure in the cylinder. The valve 690 will have been closed as the bumpers moved upwardly by the engagement of one of the clips engaging a sliding latch member 690[a] which is connected by a cable with the lever 686. While the bumper plates are being returned to their horizontal positions, the trip rods 662 are returned to their normal positions, as illustrated by full lines in Fig. 41, through the operation of a lever 711 which is pivoted on the plate 684. This lever has a dog 712 pivoted on the lower end thereof and it is connected by a rod 713 with the lever 700 through which the shaft 701 is rotated. When the lever 700 is moved toward the left as viewed in Fig. 41, by the movement of the cable 696, the dog 712 rides over the pin 677 which had previously been positioned at 679, but when the lever 700 is restored to the position illustrated by full lines in Fig. 41 by the operation of the spring 707, the dog 712 is adapted to engage the pin 677 and to move the trip rods 662 to their original positions. All of the parts are thus restored to their normal positions and the driver can then take his car out of the garage along the trackways 650, the rear wheel merely passing over the trip lever 680 without producing any effect, since the pin 676 is then located in its forward position.

In the foregoing specification the garage has been described as comprising a plurality of floors with one or more series of elevator shafts arranged in rows transversely of the garage and with one storage table mounted on each side of each series of elevator shafts on each of the upper floors of the garage so that an automobile can be discharged from any elevator shaft directly onto the storage rack carried by one of the storage tables on the upper floor. In some instances it may be desirable to employ a second row of storage racks beyond the storage table and the storage racks which are located in immediate proximity to the elevator shafts on the upper floors, as shown in Fig. 3, where a series of storage racks 720 are shown at the bottom of the figure arranged in a row with one of the storage tables 320 and its storage racks 330 located between them and the elevator shafts. When this arrangement is employed the automobiles must be transferred from the elevator platform to the storage racks 720 over the intermediate storage table and storage racks. For this purpose one or more of the intermediate storage racks on the storage table may be provided with suitable mechanism for effecting the transfer of the automobiles from the elevator shafts to and from the storage racks 720. This transfer mechanism is not shown and described inasmuch as it does not constitute a part of the present invention.

In connection with the operation of the garage heretofore described, it is desirable to

employ a ticket checking system to provide the owner of each automobile with a receipt for his car and to enable the attendants at the garage to identify the automobile when the receipt is presented. This checking system preferably includes a composite ticket 725, one of which is used for each automobile stored in the garage. As illustrated in Fig. 44, each ticket comprises the component parts 726, 727, and 728 which are united by lines of perforations 729, 730, so that they can be readily separated when desired. The tickets are numbered serially and the component parts of each ticket bear the same serial number as indicated at 731 in the upper left hand corner of each part, and each component part of the ticket is further marked in the upper right hand corner to indicate the elevator shaft of the garage where the automobile is received and elevated to the storage floor. For example the elevator shafts may be marked A, B, C, D, etc., and as shown in the drawing, each part 726, 727, 728 of the ticket is marked in the upper right hand corner with the letter A to indicate that the automobile was received in elevator shaft A. Each part of the ticket is further marked with an indication "10—2", for example, as shown at 732, which indicates the floor of the building and the storage rack on which the automobile is stored, in this case the tenth floor and the second rack served by elevator shaft A. This marking is placed on each tab of the ticket when the automobile is received on the storage platform, at which time the operator determines by reference to the enunciator board 450 and by the operation of the punching mechanism on the dial 362, the floor and storage rack in which the automobile is to be placed. In addition to the marking heretofore mentioned, the middle tab 727 of the ticket is marked to indicate the time of day when the automobile was received in the garage; for example, the part 727 of the ticket shown in the drawing is marked "8:10 a. m." If desired the middle tab of the ticket 727 may further be marked with the license number of the customer's automobile, for example, "562—222". The lower tab 728 of the ticket bears no indication except the serial number, the letter indicating the elevator shaft in which the automobile was received, and the marking to indicate the floor and rack in which the automobile is stored. The upper tab 726 may have printed thereon, in addition to the indications which are carried by the lower part 728, an indication by the attendant to describe any work which the owner wishes to have done on the automobile while it is in storage, for example, the washing of the car. The upper part 726 and the middle part 727 are retained by the garage and the lower part 728 is delivered to the owner of the automobile. When the owner returns to the garage later in the day it will be necessary for him to present the part 728 of the ticket to the attendant in the office of the garage and to have that part of the ticket marked "Paid" or with any other marking which will authorize the attendant at the elevator shaft to lower the automobile and deliver it to the person who presents the ticket. When the part 728 is presented at the office, the attendant there may ascertain whether the person who presents the ticket is the real owner of the automobile by inquiring the time of day when the automobile was placed in storage, or by inquiring the license number, either or both of which items of information are recorded on the part 727 of the ticket which is retained in the office of the garage, but neither of which is present on the part 728 which was delivered to the owner, so that if the part 728 was lost by the real owner and picked up by someone else, the withdrawal of the automobile from the garage by an unauthorized person would be effectually prevented. Although the operation of the invention is doubtless clear from the foregoing description, it may be desirable, by way of example, to summarize briefly the sequence of operations followed in placing an automobile in storage and removing it from the garage. When the driver of an automobile approaches the garage, he selects any desired entrance to the building and drives in along one of the runways 52 on the ground floor 50. The automobile is driven by its own power onto one of the loading platforms 60 and when the front wheels have reached a position sufficiently near the forward end of the platform, one of them encounters the switch 88 which thereupon closes the circuit of the solenoid 100 and operates the switch 103 to admit compressed air to the cylinder 105 and bring about the lowering of the gate 126 across the entrance to the loading platform. This prevents another automobile from driving partially onto the platform while the first automobile is in position thereon. The lowering of the gate withdraws the rod 117 from the stem 123 so that the attendant can move the stem upwardly by seizing the handle 124 thereof. This will admit compressed air to the cylinder 130 and set in motion the apparatus by which the loading platform is raised at its rear end and when the platform reaches the upper limit of its movement the stop members 148 are withdrawn from their positions in advance of the front wheels of the automobile which then rolls by gravity across the stationary ledge 69 of the concrete floor onto the elevator platform 63. Before the attendant moves the stem 123 upward to effect the raising of one end of the loading platform, the driver and other occupants of the automobile will have descended to the floor and the owner of the automobile will have received from the attendant the portion 728 of the ticket illus-

trated in Fig. 44. The attendant, before giving the owner the ticket or receipt, will have examined the enunciator board 450 and determined therefrom the floor and storage rack on which the automobile is to be stored. The portion of the ticket delivered to the customer will contain an indication of that floor and storage rack, while the ticket portion 727 retained by the attendant will have noted thereon also the date and time of day when the automobile entered the garage. This part of the ticket may also have entered thereon the license number of the automobile. Having selected the storage rack on which the automobile is to be placed, the attendant then operates one of the punches 370 or 373 through the proper hole in the dial 362 in order to actuate one of the tube switches 380 and thereby set in motion the apparatus for positioning the selected storage rack opposite the adjacent elevator shaft on the upper floor of the garage. After this has been done and, assuming that the fire doors of the elevator shaft have been opened to permit the automobile to roll from the loading platform onto the elevator platform, the attendant then steps onto the running board 251 of the elevator car and closes the fire doors on the ground floor. The elevator controller 253 is then operated to cause the car to be lifted to the desired upper floor of the garage and upon reaching that floor, the fire doors at one side of the elevator shaft are opened, thereby permitting the closing of the electric circuit for raising one end of the elevator platform. The attendant then closes the switch 283 or 298, whichever is located at the end of the storage platform opposite the end which is to be elevated, and, when this switch is closed, a circuit is established which causes the motor 188 in the upper part of the elevator car to raise the lifting bars at one end of the car and thereby elevate the platform. When the end of the platform reaches the upper limit of its movement the circuit of the motor is opened by the automatic operation of one of the upper limit switches 284 or 296, and at the same time the bumpers 215 adjacent the lower end of the elevator platform are depressed by the cables 232 so that the automobile is then free to roll by gravity over the adjacent ledge 69 onto the selected storage rack 330, which has previously been positioned opposite the elevator shaft. After the motor 188 is stopped by the opening of the upper limit switch, the circuit of the motor is reversed but this reversal is delayed by the operation of one of the dash pots 293 or 311 for a sufficient length of time to permit the automobile to roll by gravity from the platform before the elevated end of the platform begins to fall. The platform then returns automatically to its normal horizontal position and when it reaches that position the circuit thereof is opened by one of the lower limit switches 292 or 310. As the automobile passes from the elevator platform, it rolls smoothly onto the storage rack due to the fact that the lower end of the elevator platform remains substantially stationary and is on the same level as the storage rack. As the automobile passes onto the storage rack, it is brought to rest by engagement with the stationary bumpers 630 and the movable bumpers 215 then rise up behind the automobile to prevent the return movement thereof toward the elevator shaft. The automobile is then in storage and remains on the rack of the storage table until the owner presents the portion 728 of the ticket to the attendant at a later time. When this ticket is presented, the attendant may inquire the time of day when the automobile was placed in storage, or the license number, in order to determine definitely whether the person presenting the ticket is entitled to receive the automobile which is in storage on the rack and floor indicated by the ticket. Having done so, the attendant then operates one of the punches through the dial 377 to operate the tube switch 381 and set in motion the apparatus by which the storage rack is again positioned opposite the elevator shaft on the upper floor. The operation of this switch extinguishes the red light and actuates a green light on the enunciator board 450 to indicate that the storage rack, from which the automobile has just been removed, is unoccupied. The attendant then rides up on the elevator car to the desired floor and when he reaches that floor the automobile is returned to the platform of the elevator by the elevation of the end of the storage rack through the mechanism which is illustrated diagrammatically in Fig. 39. When the end of the rack reaches the upper limit of its movement the circuit of the lifting motor 523 is automatically opened and during the reversal of the motor, which is delayed by the relay 622, the bumpers 215 are depressed and the automobile rolls by gravity onto the elevator platform. The circuit of the rack lifting mechanism is then reversed and the rack is automatically restored to its horizontal position. When the elevator car reaches the ground or exit floor of the garage, the attendant opens the fire door and sets in operation the circuit of the motor 188, thereby causing one end of the elevator platform to be lifted and rolling the automobile by gravity onto the run-ways 650 at the discharge side of the elevator shaft. The stop mechanism illustrated in Figs. 40, 41, and 42, then operates automatically to bring the automobile to rest and the owner of the automobile assumes his position on the driver's seat while the stop mechanism is automatically returning to its depressed position. The driver is then free to take the automobile out of the garage under its own power.

Although one embodiment of the invention has been shown and described for purposes of illustration, it will be understood that it may be embodied in various other forms without departing from the scope of the appended claims.

I claim:

1. A garage comprising a loading platform arranged to receive an automobile over one end thereof, an elevator car having a supporting floor normally on the same horizontally level with said loading platform, and means independent of the movement of the elevator car for lifting said end of said platform to cause said automobile to pass over the opposite end of said platform onto said elevator car.

2. A garage comprising a loading platform to receive an automobile, an elevator car, means for raising one end of said loading platform for moving said automobile onto said elevator car, and a gate movable across the rear end of said loading platform.

3. A garage comprising a loading platform arranged to receive an automobile over one end thereof, an elevator shaft, an elevator car in said shaft having a platform, lifting mechanism operating independently of the movement of the elevator car for lifting said end of said loading platform to cause said automobile to pass over the opposite end of said loading platform onto said elevator platform, and manually operated means for controlling the operation of said lifting mechanism.

4. A garage comprising a normally horizontal loading platform, an elevator car having a normally horizontal platform, means for elevating one end of said loading platform to move an automobile therefrom onto said elevator platform, and means for raising one end of said elevator platform to move said automobile therefrom.

5. A garage comprising a loading platform to receive an automobile over one end thereof, an elevator shaft, an elevator car having a platform, means for elevating said end of said loading platform to move said automobile over the opposite end thereof onto said elevator platform, and means for raising one end of said elevator platform to move said automobile therefrom.

6. A garage comprising a plurality of floors, including an entrance floor, a loading platform to receive an automobile on said entrance floor, a storage table on another of said floors, an elevator shaft, an elevator car having a platform, means for raising one end of said loading platform to move said automobile onto said elevator platform, means for raising said elevator car, and means for raising an end of said elevator platform to move said automobile onto said storage table.

7. A garage comprising a plurality of floors including an entrance floor, an elevator car having a platform adapted to receive an automobile from said entrance floor, a storage table on another of said floors, means for raising said elevator car to said other floor, means for elevating one end of said elevator platform to move said automobile therefrom onto said storage table, and stationary means for bridging the space between said elevator platform and said storage table.

8. A garage comprising a plurality of floors, including an entrance floor, an elevator shaft, an elevator car having a platform to receive an automobile from said entrance floor, a storage table on another of said floors, a plurality of storage racks mounted on said table, means for shifting said table to position one of said racks opposite said elevator shaft, means for raising said elevator car to said other floor, and means for raising one end of said elevator platform to move said automobile therefrom onto the storage rack positioned opposite thereto.

9. A garage comprising a plurality of floors including an entrance floor, a loading platform to receive an automobile on said entrance floor, an elevator shaft, an elevator car having a platform, a storage table mounted on another of said floors, a plurality of storage racks mounted on said table, means for raising one end of said loading platform to move said automobile onto said elevator platform, means for raising said elevator car, means for shifting said table to position one of said racks opposite said elevator shaft, and means for raising one end of said elevator platform to move said automobile therefrom onto the storage rack positioned opposite thereto.

10. A garage comprising a plurality of floors including an entrance floor, an elevator shaft, an elevator car having a platform adapted to receive an automobile on said entrance floor, storage tables mounted on opposite sides of said elevator shaft on another of said floors, means for raising said elevator car to said other floor, and means for raising either end of said elevator platform with the other end stationary to move said automobile therefrom onto either of said storage tables.

11. A garage comprising a plurality of floors including an entrance floor, an elevator shaft, an elevator car having a platform adapted to receive an automobile on said entrance floor, storage tables mounted on opposite sides of said elevator shaft on another floor, a plurality of storage racks mounted on each of said storage tables, means for shifting either of said tables to position any one of said racks opposite said elevator shaft, means for raising said elevator car to said other floor, and means for raising either end of said elevator platform with the other end stationary to move said automobile therefrom onto the storage rack positioned opposite thereto.

12. A garage comprising a plurality of floors including an entrance floor, a loading platform to receive an automobile on said entrance floor, an elevator shaft, an elevator car having a platform, storage tables mounted on opposite sides of said elevator shaft on another of said floors, a plurality of storage racks mounted on each of said tables, means for shifting each of said tables to position any one of said storage racks opposite said elevator shaft, means for raising said elevator car to said other floor, and means for raising either end of said elevator platform with the other end stationary to move said automobile therefrom onto a storage rack positioned opposite thereto.

13. A garage comprising a plurality of floors including an entrance floor, an elevator shaft, an elevator car having a platform to receive an automobile from said entrance floor, a storage table on another of said floors, a plurality of storage racks mounted on said table, means for shifting said table to position any one of said storage racks opposite said elevator shaft, means for raising said elevator car, means for raising one end of said elevator platform with the other end stationary to move said automobile therefrom onto the storage rack positioned opposite thereto, and means for raising one end of said last mentioned storage rack with the other end thereof stationary to return said automobile therefrom onto said elevator platform.

14. A garage comprising a plurality of floors including an entrance floor, a plurality of parallel automobile run-ways on said entrance floor, and a series of elevator shafts each located in alignment with one of said runways and each adapted to receive automobiles from one side of said garage, said elevator shafts being arranged in rows with those of alternate runways located in one row and those of the intermediate runways located in another row, said runways being independent of each other.

15. A garage comprising a plurality of floors including an entrance floor, an elevator shaft, an elevator car adapted to receive an automobile from said entrance floor, a storage table on another of said floors, means for raising said elevator car to said other floor, and means controlled from said entrance floor for shifting said table to position a selected part thereof opposite said elevator shaft.

16. A garage comprising a plurality of floors including an entrance floor, an elevator shaft, an elevator car adapted to receive an automobile from said entrance floor, a storage table for a plurality of automobiles on another of said floors, means for raising said elevator car to said other floor, means for indicating on said entrance floor the parts of said storage table which are occupied and unoccupied, and means controlled from said entrance floor for shifting said table to position any selected part thereof opposite said elevator shaft.

17. A garage comprising a plurality of floors including an entrance floor, an elevator shaft, an elevator car movable in said shaft and adapted to receive an automobile from said entrance floor, storage tables mounted on other floors of said garage, means for indicating on said entrance floor the storage spaces of said tables which are occupied and unoccupied by automobiles, and means controlled from said entrance floor for shifting any of said tables to position any selected storage spaces opposite said elevator shaft.

18. A garage comprising a plurality of floors including an entrance floor, a series of elevator shafts arranged in a row transversely of said garage, a loading platform located opposite each of said elevator shafts on said entrance floor to receive automobiles therefrom, elevator cars having platforms, one of said elevator cars being located in each of said shafts, a storage table movable parallel to said row of elevator shafts on another of said floors, means for raising one end of each of said loading platforms to move an automobile therefrom onto one end of said elevator platform, means for raising each of said elevator cars to said other floor, means for raising one end of each of said elevator platforms to move automobiles therefrom onto said storage table, and means for shifting said storage table to position any automobile thereon opposite one of said elevator shafts.

19. A garage comprising a plurality of floors including an entrance floor, a series of elevator shafts arranged in a row transversely of said garage, a series of elevator cars each having a platform and each located in one of said shafts, said elevator platforms being adapted to receive automobiles from said entrance floor, a storage table movable parallel to said row of elevator shafts on another of said floors, a plurality of storage racks mounted on said table, means for raising said elevator cars, means for raising one end of each of said elevator platforms to move automobiles therefrom onto said storage racks, means for shifting said table to position each of said storage racks opposite one of said elevator shafts, and means for raising one end of each storage rack to move the automobile therefrom into one of said elevator shafts.

20. A garage comprising a plurality of floors including an entrance floor, an elevator shaft, an elevator car having a platform adapted to receive an automobile from said entrance floor, a storage table movable transversely to said elevator shaft on another of said floors, a plurality of storage racks mounted on said table, means controlled from said entrance floor for shifting said

table to position one of said racks opposite said elevator shaft, means for raising said elevator car to said other floor, and means for raising one end of said elevator platform to move said automobile therefrom onto the storage rack opposite thereto.

21. A garage comprising a plurality of floors including an entrance floor, an elevator shaft, an elevator car having a platform to receive an automobile from said entrance floor, a storage table movable transversely to said elevator shaft on another of said floors, a plurality of storage racks mounted on said table, means for determining on said entrance floor the specific storage racks which are unoccupied, means controlled from the entrance floor for shifting said table to position a selected one of said unoccupied storage racks opposite said elevator shaft, means for raising said elevator car to said other floor, and means for raising one end of said elevator platform to move said automobile therefrom onto the storage rack located opposite thereto.

22. A garage comprising a plurality of floors including an entrance floor, an elevator shaft, an elevator car having a platform to receive an automobile from said entrance floor, a storage table movable transversely to said elevator shaft on another of said floors, a plurality of storage racks mounted on said table, means for determining on said entrance floor the specific storage racks which are unoccupied, means controlled from the entrance floor for shifting said table to position a selected one of said unoccupied storage racks opposite said elevator shaft, means for raising said elevator car to said other floor, means for raising one end of said elevator platform to move said automobile therefrom onto the storage rack located opposite thereto, means controlled from the exit floor of the garage for shifting said table to position an occupied storage rack opposite one of said elevator shafts, means actuated by said last named means for indicating on said entrance floor the removal of an automobile from the occupied storage rack, and means for raising one end of said occupied storage rack to move the automobile therefrom onto the platform of said elevator car.

23. A garage comprising a plurality of floors including an entrance floor, a plurality of elevator shafts, a plurality of elevator cars each having a platform and each located in one of said shafts, each of said elevator platforms being adapted to receive an automobile from said entrance floor, a storage table mounted on another of said floors, a plurality of storage racks mounted on said table, each of said storage racks being adapted to receive an automobile from one of said elevator shafts, means for indicating on said entrance floor the storage racks which are unoccupied, and means controlled from said entrance floor for shifting said table to position a selected unoccupied storage rack opposite one of said elevator shafts.

24. A garage comprising a plurality of floors including an entrance floor, a series of elevator shafts, elevator cars each located in one of said shafts, said elevator cars being adapted to receive automobiles from said entrance floor, a plurality of storage tables mounted on other floors of said garage, each of said tables being adapted to receive automobiles from all of said elevator cars, and means controlled from the entrance floor for shifting each of said tables to position them with respect to said elevator shafts.

25. A garage comprising a plurality of floors including an entrance floor, a series of elevator shafts, elevator cars each having a platform and each located in one of said shafts, said elevator platforms being adapted to receive automobiles from said entrance floor, a plurality of storage tables mounted on other floors of said garage, each of said tables being adapted to receive automobiles from all of said elevator cars, means controlled from the entrance floor for shifting each of said tables to position them with respect to said elevator shafts, means for raising said elevator cars, and means for raising one end of each of said elevator platforms to move the automobiles therefrom onto said storage tables.

26. A garage comprising a loading platform to receive an automobile, a gate movable across the entrance to said loading platform, and means actuated by a wheel of said automobile on said platform for operating said gate.

27. A garage comprising a platform to receive an automobile, a gate, means actuated by a wheel of said automobile on said platform for moving said gate to close the entrance to said platform, means for elevating one end of said platform to move said automobile therefrom, and means actuated by the movement of said platform for operating said gate to open the entrance to said platform.

28. A garage comprising an entrance floor having a loading platform adapted to receive an automobile, an elevator shaft adjacent said loading platform, an elevator car in said shaft having a platform extending normally in a horizontal plane substantially level with the discharge end of said loading platform, means for elevating one end of said loading platform to move an automobile therefrom onto said elevator platform, and means for elevating one end of said elevator platform to move said automobile therefrom.

29. A garage comprising a platform having longitudinal channels to receive the wheels of an automobile, said channels having apertures, bumper mechanism having parts extending normally through said aper-

tures in said channels to engage the automobile wheels, and means for withdrawing said bumpers to permit the automobile to pass from said platform.

30. A garage comprising a platform to receive an automobile, a stop member to limit the forward motion of said automobile on said platform, means for raising one end of said platform, and means actuated by the final upward movement of said platform for withdrawing said stop member to permit said automobile to roll by gravity from said platform.

31. A garage comprising a loading platform to receive an automobile, a gate, means actuated by a wheel of said automobile on said platform for moving said gate to close the entrance to said platform, and means controlled by the actuation of said gate operating means for elevating one end of said platform to move said automobile therefrom.

32. A garage comprising a loading platform to receive an automobile, a gate, means actuated by a wheel of said automobile on said platform for moving said gate to close the entrance to said platform, means controlled by the actuation of said gate operating means for elevating one end of said platform to move said automobile therefrom, and means actuated by the final raising movement of said platform for actuating said gate to open the entrance to said platform.

33. A garage comprising a loading platform, a gate movable across the entrance to said platform, fluid actuated means for operating said gate, means actuated by the engagement therewith of an automobile on said platform for controlling said fluid actuated means, and means for elevating one end of said platform.

34. A garage comprising an entrance floor having a runway for automobiles, a loading platform in said runway, an elevator car, operating mechanism located beneath said loading platform for elevating one end thereof to discharge an automobile therefrom into said elevator car, and means for preventing the actuation of said mechanism until the automobile has passed fully onto said loading platform.

35. A garage comprising an entrance floor having a runway to receive automobiles, a pit in said runway, a loading platform mounted over said pit, an elevator car adapted to receive automobiles from said loading platform, and mechanism in said pit operated independently of the movement of said elevator car for raising one end of said loading platform to discharge said automobile therefrom into said elevator car.

36. A garage comprising a loading platform, a gate, means actuated by the engagement therewith of an automobile on said platform for moving said gate to close the entrance to said platform, raising means for elevating one end of said platform, a manually operated member for controlling said raising means, and means for preventing the operation of said manually operated member until said gate has been actuated.

37. A garage comprising a loading platform, a pivotally mounted gate movable across the entrance to said platform, fluid actuated means for moving said gate in the closing direction, means for elevating one end of said platform, and means actuated by the upward movement of said platform for moving said gate in the other direction.

38. A garage comprising a platform, means comprising a compressed air cylinder for raising one end of said platform, means for admitting compressed air to said cylinder, and means actuated by the final upward movement of said platform for permitting said compressed air to escape from said cylinder.

39. A garage having a floor provided with a pit, a platform mounted over said pit, means for pivotally supporting one end of said platform, a shaft mounted in said pit adjacent the other end of said platform, a drum mounted on said shaft, a bar pivotally connected to said platform and having its free end extending downwardly therefrom in contact with the periphery of said drum, and a cable wound on said drum having the outer end thereof extending downwardly and connected to the free end of said bar.

40. A garage having a floor provided with a pit, a platform mounted over said pit, means for pivotally supporting one end of said platform, a shaft mounted in said pit adjacent the other end of said platform, a drum mounted on said shaft, a bar connected to said platform, a cable wound on said drum and connected to said bar, a second drum mounted on said shaft, a second cable mounted on said second drum, a cylinder having a piston and piston rod connected to said second cable, and means for admitting compressed fluid to said cylinder.

41. A garage comprising an elevator car, an elevator platform carried by said car to support an automobile, and motor operated means for raising an end of said platform while said elevator car is stationary with the other end thereof stationary to move said automobile therefrom.

42. A garage comprising an elevator car, an elevator platform carried by said car to support an automobile, and means for raising either end of said platform with the other end thereof stationary to move said automobile therefrom.

43. A garage comprising an elevator car, an elevator platform carried by said car to support an automobile, means for raising one end of said platform to move said automobile therefrom, and means for automatically arresting the operation of said raising means

when said platform has reached a predetermined inclined position.

44. A garage comprising an elevator car, an elevator platform carried by said car to support an automobile, means for raising one end of said platform to move said automobile therefrom, means for automatically arresting the operation of said raising means when said platform has reached a predetermined inclined position, and means for effecting the reverse operation of said raising means to return said platform to its normal position.

45. A garage comprising an elevator car, an elevator platform carried by said car to support an automobile, means for raising one end of said platform to move said automobile therefrom, means for automatically arresting the operation of said raising means when said platform has reached a predetermined inclined position, means for effecting the reverse operation of said raising means to return said platform to its normal position, and means for automatically arresting the reverse operation of said raising means when said platform reaches its normal position.

46. A garage comprising an elevator car, an elevator platform carried by said car to support an automobile, means for raising one end of said platform to move said automobile therefrom, means for automatically arresting the operation of said raising means when said platform has reached a predetermined inclined position, means for effecting the reverse operation of said raising means to return said platform to its normal position, and means for automatically delaying the reverse operation of said raising means until said automobile has rolled from said platform.

47. A garage comprising an elevator car, an elevator platform carried by said car for supporting an automobile, lifting bars connected to the end of said platform, mechanism connected to said lifting bars for elevating the end of said platform while the elevator car is at rest, and independent means for raising said elevator car.

48. A garage comprising an elevator car, an elevator platform carried by said car for supporting an automobile, lifting bars connected to the end of said platform, cables connected to said lifting bars, an electric motor, and means for forming an operative connection between said motor and said cables.

49. A garage comprising an elevator car, an elevator platform carried by said car for supporting an automobile, lifting bars connected to the end of said platform, a push car connected to said cable, a second push car adapted to engage said first push car, a track for supporting said push cars in their travel, a motor, and means for connecting said motor to said second push car.

50. A garage comprising an elevator car, an elevator platform adapted to receive an automobile, lifting bars connected to the ends of said platform, cables connected to said lifting bars, an electric motor, a pair of push cars located on opposite sides of said motor, means comprising cables for connecting said motor with said push cars, a second pair of push cars located between said first named push cars and said motor on opposite sides thereof, and cables connecting said second named push cars with said lifting bars whereby the rotation of said motor in either direction is adapted to raise one end of said elevator platform.

51. A garage comprising an elevator car, an elevator platform for supporting an automobile, an electric motor connected to said platform for lifting one end thereof, a circuit for said electric motor, and means actuated by a predetermined elevation of the end of said platform for opening the circuit of said motor.

52. A garage comprising an elevator car, an elevator platform for supporting an automobile, lifting bars connected to one end of said platform, a cross bar connecting said lifting bars, an electric motor connected to said lifting bars for elevating one end of said platform, a circuit for said motor, and means actuated by the engagement therewith of said cross bar for opening said circuit and arresting the operation of said motor.

53. A garage comprising an elevator shaft, an elevator car in said shaft, an elevator platform adapted to support an automobile, doors for closing said shaft, an electric motor, connections from said motor to one end of said elevator platform, an electric circuit for said motor, a normally open switch in said circuit adapted to be closed by the final opening movement of said doors, and additional means for controlling said circuit.

54. A garage comprising an elevator shaft, an elevator car in said shaft, an elevator platform adapted to support an automobile, doors for closing said shaft, an elevator motor, connections from said motor to one end of said elevator platform, an electric circuit for said motor, a normally open switch in said circuit adapted to be closed by the final opening movement of said doors, a manually operated switch for closing said circuit after said doors are opened, and means for automatically forming a shunt circuit around said manually operated switch after said motor is in operation.

55. A garage comprising an elevator car, an elevator platform for supporting an automobile, an electric motor, connections between said motor and the end of said platform to effect the elevation of the end of said platform upon operation of said motor, an electric circuit for said motor, means for closing said circuit, means actuated at the upper limit of movement of said platform for opening said circuit and arresting the operation of

said motor, means actuated upon the stopping of said motor for reversing the circuit therethrough, and lowering said platform, said last named means having a time-lag to permit said automobile to roll from said platform while the end thereof is elevated, and means actuated upon the return of said platform to its normal position for arresting the reverse operation of said motor.

56. A garage comprising an elevator car, an elevator platform adapted to support an automobile, an electric motor, connections from said motor to said platform to effect an elevation of one end of said platform by the operation of said motor in one direction, an electric circuit for said motor, a manually operated switch for closing said circuit, electro-magnetic means for establishing a shunt around said manually operated switch after said motor is in operation, an upper limit switch adapted to be operated when the end of said platform reaches its upper limit to open said circuit and arrest the operation of said motor, a branch circuit including a lower limit switch adapted to close automatically during the elevation of said platform, means having a time-lag for establishing the circuit of said motor through said branch circuit and said lower limit switch to effect the rotation of the motor in the opposite direction, the reverse movement of said motor being limited by the opening of said lower limit switch during the downward movement of the end of said elevator platform.

57. A garage comprising an elevator car, an elevator platform adapted to support an automobile, cross bars beneath the ends of said platform, lifting bars attached to the ends of said cross bars, a motor, operating connections from said motor to said cross bars, and an electric circuit for effecting the operation of said motor in either direction to elevate either of said cross bars and thereby lift either end of said elevator platform.

58. A garage comprising an elevator car, an elevator platform having parallel trackways, bumpers mounted on said trackways at opposite ends thereof and acting normally to permit the automobile to pass thereover in one direction and to prevent its passage in the opposite direction, and means for depressing said bumpers to permit the passage of said automobile in said opposite direction.

59. A garage comprising an elevator car, an elevator platform having parallel trackways, bumpers mounted on said trackways at opposite ends thereof and acting normally to permit an automobile to pass thereover in one direction and to prevent its passage in the opposite direction, means for lifting one end of said platform, and means actuated by said lifting movement for depressing the bumpers at the opposite end of said platform to permit the passage of said automobile thereover in said opposite direction.

60. A garage comprising an automobile platform having longitudinal trackways, bumpers mounted on said trackways and inclined upwardly and longitudinally from the opposite end portions thereof, means acting normally to hold said bumpers in their elevated positions, means for elevating either end of said platform, and means actuated by the elevation of one end of said platform for depressing the bumpers at the other end of said platform.

61. A garage comprising a platform adapted to support an automobile, a bumper plate pivoted on said platform, means tending normally to hold said bumper plate inclined upwardly from said platform, and means connected to said plate and actuated by the engagement therewith of a wheel of said automobile for rigidly supporting said bumper plate in said inclined position.

62. A garage comprising a platform adapted to support an automobile, a bumper plate pivoted at one end on said platform, and inclined upwardly therefrom, a supporting plate connected to the free end of said bumper plate, a detent mounted adjacent said supporting plate, said supporting plate being adapted upon engagement therewith of a wheel of said automobile to move into a position over said detent to form a rigid support for said bumper plate, means for elevating the end of said platform opposite said bumper plate, and means actuated by the elevation of said platform for removing said detent from engagement with said supporting plate and for depressing said bumper plate to permit said automobile to pass thereover.

63. A garage comprising a storage table for automobiles, means for shifting said storage table, and means for automatically and selectively predetermining the extent of said shifting movement.

64. A garage comprising an elevator shaft, an elevator car movable in said shaft, a storage table having a plurality of storage spaces, and means for shifting said table through a predetermined continuous movement transversely to said elevator shaft for selectively positioning any one of said storage spaces opposite said elevator shaft.

65. A garage comprising a storage table, means for shifting said storage table, means for effecting a reverse operation of said shifting means, and means for preventing said reverse operation until said table has reached a predetermined position.

66. A garage comprising an elevator shaft, a storage table having a plurality of storage spaces, means for shifting said table to position one of said storage spaces opposite said elevator shaft, and remote controlled means for effecting the operation of said shifting means.

67. A garage comprising a storage table

for automobiles, means for shifting said storage table, remote controlled means for effecting the operation of said shifting means, and means actuated by the movement of said table for discontinuing the operation of said shifting means.

68. A garage comprising an elevator shaft, a storage table having a plurality of storage spaces, means for shifting said table to position a selected one of said storage spaces opposite said elevator shaft, remote controlled means for effecting the operation of said shifting means, and means for maintaining the continued operation of said shifting means until the selected storage space has been positioned opposite said elevator shaft.

69. A garage comprising a storage table for automobiles, means comprising an electric motor for shifting said table, an electric circuit for operating said motor, and a circuit opening device connected in said circuit and actuated by said table.

70. A garage comprising a storage table for automobiles, means comprising an electric motor for shifting said table, an electric circuit for controlling the operation of said motor, a switch for closing said circuit, and means for automatically opening said circuit.

71. A garage comprising a storage table for automobiles, means comprising an electric motor for shifting said table, an electric circuit for controlling the operation of said motor, a switch for closing said circuit, means included in said circuit for automatically opening said circuit after a predetermined movement of said table, and means for preventing a second operation of said switch until said predetermined movement of said table has been completed.

72. A garage comprising an elevator shaft, a storage table having a plurality of storage spaces, means including an electric motor for moving said storage table to position one of said storage spaces opposite said elevator shaft, an electric circuit for effecting and controlling the operation of said motor, a plurality of switches each adapted to close said circuit to effect the positioning of one of said storage spaces opposite said elevator shaft, and means controlled by the actuation of said switches for indicating which storage spaces are occupied and unoccupied.

73. A garage comprising an elevator shaft, a storage table having a plurality of storage spaces, means including an electric motor for moving said storage table to position one of said storage spaces opposite said elevator shaft, an electric circuit for effecting and controlling the operation of said motor, a plurality of switches each adapted to close said circuit to effect the positioning of one of said storage spaces opposite said elevator shaft, an enunciator comprising devices for indicating which storage spaces of said table are occupied and unoccupied and means actuated by the operation of said switches for effecting the operation of said indicating devices.

74. A garage comprising an elevator shaft, a storage table having a plurality of storage spaces, means comprising an electric motor for moving said table, an electric circuit for effecting and controlling the operation of said motor, said circuit having a plurality of branches, a selector connected in said circuit and actuated by the movement of said table, said selector having a plurality of contacts connected in said branch circuits and each adapted to open said circuit after a predetermined movement of said table, and a plurality of switches each connected in one of said branch circuits and each adapted upon the closing thereof to effect the movement of said table to an extent determined by said selector to position one of said spaces on said storage table opposite said elevator shaft.

75. A garage comprising an elevator shaft, a storage table having a plurality of storage spaces, means comprising an electric motor for moving said table, an electric circuit for effecting and controlling the operation of said motor, said circuit having a plurality of branches, a selector connected in said circuit and actuated by the movement of said table. said selector having a plurality of contacts connected in said branch circuits and each adapted to open said circuit after a predetermined movement of said table, a plurality of switches each connected in one of said branch circuits and each adapted upon the closing thereof to effect the movement of said table to the extent predetermined by said selector to position one of said spaces on said storage table opposite said elevator shaft, and a dial having said switches associated therewith and having means thereon indicating the relation of said switches to the respective storage spaces on said table.

76. A garage comprising an elevator shaft, a storage table having a plurality of storage spaces, means comprising an electric motor for moving said table, an electric circuit for effecting and controlling the operation of said motor, said circuit having a plurality of branches, a selector connected in said circuit and actuated by the movement of said table, said selector having a plurality of contacts connected in said branch circuits and each adapted to open said circuit after a predetermined movement of said table, a plurality of switches each connected in one of said branch circuits and each adapted upon the closing thereof to effect the movement of said table to the extent predetermined by said selector to position one of said spaces on said storage table opposite said elevator shaft, a dial having said switches associated therewith and having means thereon indicating the relation of said switches to the

respective storage spaces on said table, said dial having a plurality of apertures therethrough, and a punch insertable through said apertures to effect the operation of said switches.

77. A garage comprising an elevator shaft, a storage table having a plurality of storage spaces, means comprising an electric motor for moving said table, an electric circuit for effecting and controlling the operation of said motor, said circuit having a plurality of branches, a selector connected in said circuit and actuated by the movement of said table, said selector having a plurality of contacts connected in said branch circuit and each adapted to open said circuit after a predetermined movement of said table, a plurality of switches each connected in one of said branch circuits and each adapted upon the closing thereof to effect the movement of said table to the extent predetermined by said selector to position one of said spaces on said storage table opposite said elevator shaft, a dial having said switches associated therewith and having means thereon indicating the relation of said switches to the respective storage spaces on said table, said dial having a plurality of apertures therethrough, a punch insertable through said apertures to effect the operation of said switches, and an enunciator board having indicating devices thereon actuated by the operation of said switches for indicating which storage spaces on said table are occupied and unoccupied.

78. A garage comprising a storage table, a plurality of storage racks mounted on said table, operating mechanism mounted adjacent said table, and means for operatively connecting said operating mechanism with any selected storage rack to effect the elevation of one end thereof.

79. A garage comprising an elevator shaft, an elevator car having a platform, a storage rack located opposite said elevator shaft, and means for raising the end of said rack removed from said elevator shaft with the other end of said rack stationary at the level of said elevator platform.

80. A garage comprising a storage rack, means for raising one end of said storage rack, means for effecting a reverse operation of said raising means, and means for preventing said reverse operation until said rack has reached a predetermined position.

81. A garage comprising a series of elevator shafts arranged in a row, a storage table movable parallel to said row of elevator shafts, a plurality of storage racks mounted on said table, means for moving said table to position any one of said storage racks opposite one of said elevator shafts, and means for selectively raising the ends of said racks removed from said elevator shafts with the other ends thereof stationary.

82. A garage comprising a series of elevator shafts arranged in a row, a storage table movable parallel to said row of elevator shafts, a plurality of storage racks mounted on said table, means for moving said table to position any one of said storage racks opposite one of said elevator shafts, means for selectively raising the ends of said racks removed from said elevator shafts with the other ends thereof stationary, and means comprising an electric circuit including an electric motor and electro-magnetic mechanism for effecting and controlling the operation of said raising means.

83. A garage comprising a storage rack, a shaft extending adjacent said rack, means mounted on said shaft and connected to said rack for elevating one end thereof, means for effecting a driving engagement between said shaft and said last named means, and means for driving said shaft.

84. A garage comprising a plurality of storage racks, a horizontal shaft, a series of drums mounted on said shaft, a cable mounted on each of said drums and having an operative connection with one of said racks, a clutch for forming a driving connection between said shaft and each of said drums, means for driving said shaft, means for operating said clutches.

85. A garage comprising a plurality of storage racks, a horizontal shaft, a series of drums mounted on said shaft, a cable mounted on each of said drums and having an operative connection with one of said racks, a clutch for forming a driving connection between said shaft and each of said drums, means for driving said shaft, and means comprising electro-magnetic mechanism for selectively operating said clutches.

86. A garage comprising a plurality of storage racks, a horizontal shaft, a series of drums mounted on said shaft, a cable mounted on each of said drums and having an operative connection with one of said racks, a clutch for forming a driving connection between said shaft and each of said drums, means for driving said shaft, mechanical connections for operating each of said clutches, a common operating member adapted to actuate each of said mechanical connections, and means for selectively forming operative connections between said common member and each of said mechanical connections.

87. A garage comprising a plurality of storage racks, a horizontal shaft, a series of drums mounted on said shaft, a cable mounted on each of said drums and having an operative connection with one of said racks, a clutch for forming a driving connection between said shaft and each of said drums, means for driving said shaft, mechanical connections for operating each of said clutches, a common operating member adapted to actuate each of said mechanical connections, a hook member connected to each of said me-

chanical connections and adapted to be engaged by said common operating member, and means comprising electro-magnetic devices for selectively throwing said hook members into position to be engaged by said common operating member.

88. A garage comprising a plurality of storage racks, a horizontal shaft, a series of drums mounted on said shaft, a cable mounted on each of said drums and having an operative connection with one of said racks, a clutch for forming a driving connection between said shaft and each of said drums, means for driving said shaft, mechanical connections for operating each of said clutches, a common operating member adapted to actuate each of said mechanical connections, a hook member connected to each of said mechanical connections and adapted to be engaged by said common operating member, means comprising electro-magnetic devices for selectively throwing said hook members into position to be engaged by said common operating member, and a motor for actuating said common operating member.

89. A garage comprising a plurality of storage racks, a horizontal shaft, a series of drums mounted on said shaft, a cable mounted on each of said drums and having an operative connection with one of said racks, a clutch for forming a driving connection between said shaft and each of said drums, means for driving said shaft, mechanical connections for operating each of said clutches, a common operating member adapted to actuate each of said mechanical connections, a hook member connected to each of said mechanical connections and adapted to be engaged by said common operating member, means comprising electro-magnetic devices for selectively throwing said hook members into position to be engaged by said common operating member, a motor for actuating said common operating member, and an electric circuit for controlling the operation of said motor and said electro-magnetic devices.

90. A garage comprising a storage rack, lifting mechanism for elevating one end of said rack, clutch mechanism for controlling the operation of said lifting mechanism, a motor for driving said lifting mechanism, a second motor for operating said clutch mechanism, and an electric circuit for controlling the operation of each of said motors.

91. A garage comprising a storage rack, lifting mechanism for elevating one end of said rack, clutch mechanism for controlling the operation of said lifting mechanism, a motor for driving said lifting mechanism, a second motor for operating said clutch mechanism, electro-magnetic means for controlling the operation of said clutch mechanism, and an electric circuit for actuating said electro-magnetic mechanism and each of said motors.

92. A garage comprising a storage rack, lifting mechanism for elevating one end of said rack, clutch mechanism for controlling the operation of said lifting mechanism, a motor for operating said lifting mechanism, a second motor for operating said clutch mechanism, electro-magnetic means for controlling the operation of said clutch mechanism, an electric circuit for actuating said electro-magnetic mechanism and each of said motors, a manually operated switch for closing said circuit, and means for establishing a shunt circuit around said manually operated switch after said first named circuit is in operation.

93. A garage comprising a storage rack, lifting mechanism for elevating one end of said rack, clutch mechanism for controlling the operation of said lifting mechanism, a motor for operating said lifting mechanism, a second motor for operating said clutch mechanism, electro-magnetic means for controlling the operation of said clutch mechanism, an electric circuit for actuating said electro-magnetic mechanism and each of said motors, means for closing said circuit, and means actuated after a predetermined elevation of an end of said rack for opening said circuit and arresting the operation of said first named motor.

94. A garage comprising a storage rack, lifting mechanism for elevating one end of said rack, clutch mechanism for controlling the operation of said lifting mechanism, a motor for operating said lifting mechanism, a second motor for operating said clutch mechanism, electro-magnetic means for controlling the operation of said clutch mechanism, an electric circuit for actuating said electro-magnetic mechanism and each of said motors, means for closing said circuit, means actuated after a predetermined elevation of an end of said rack for opening said circuit and arresting the operation of said first named motor, and means for preventing the reversal of said first named motor during its operation in one direction.

95. A garage comprising a storage rack, lifting mechanism for elevating one end of said rack, clutch mechanism for controlling the operation of said lifting mechanism, a motor for operating said lifting mechanism, a second motor for operating said clutch mechanism, electro-magnetic means for controlling the operation of said clutch mechanism, an electric circuit for actuating said electro-magnetic mechanism and each of said motors, means for closing said circuit, means actuated after a predetermined elevation of an end of said rack for opening said circuit and arresting the operation of said first named motor, a relay connected in said circuit for effecting the reversal of said first named motor after said last named means has operated, and means having a time-lag for regulating the operation of said relay.

96. A garage comprising a storage rack, lifting mechanism for elevating one end of said rack, clutch mechanism for controlling the operation of said lifting mechanism, a motor for operating said lifting mechanism, a second motor for operating said clutch mechanism, electro-magnetic means for controlling the operation of said clutch mechanism, an electric circuit for actuating said electro-magnetic mechanism and each of said motors, means for closing said circuit, means actuated after a predetermined elevation of an end of said rack for opening said circuit and arresting the operation of said first named motor, a relay connected in said circuit for effecting the reversal of said first named motor after said last named means has operated, means having a time-lag for regulating the operation of said relay, and means actuated by the lowering of said rack to its normal position for opening said circuit and arresting the reverse operation of said motor.

97. A garage comprising a trackway for an automobile, a bumper mounted on said trackway to arrest the motion of said automobile by engagement with a rear wheel thereof, and means actuated by the motion of the automobile for moving said bumper into operating position.

98. A garage comprising a trackway for an automobile, a bumper mounted on said trackway to arrest the motion of said automobile by engagement with a rear wheel thereof, and means actuated by the passage of the front wheel of said automobile thereover for moving said bumper into operating position to engage said rear wheel.

99. A garage comprising a trackway for an automobile, a bumper adapted to arrest the motion of said automobile, means for moving said bumper into position to engage said rear wheel, and a plurality of devices actuated by the successive passage of a front wheel thereover for operating said last named means.

100. A garage comprising a trackway for an automobile, a bumper adapted to arrest the motion of said automobile, by engagement with a rear wheel thereof, means for moving said bumper into position to engage said rear wheel, a plurality of devices actuated by the successive passage of a front wheel of said automobile thereover for actuating said last named means, and means for gradually restoring said bumper to its depressed position.

101. A garage comprising a trackway for an automobile, a bumper adapted to arrest the motion of said automobile, means for moving said bumper into position to engage a rear wheel thereof, devices located in advance of and beyond said bumper and actuated by the engagement therewith successively of a front wheel of said automobile for actuating said bumper moving means, means for gradually restoring said bumper to its depressed position, and means actuated by said last named means for restoring said bumper moving means to its normal position, whereby the passage of said rear wheel over said device located beyond said bumper does not affect the operation of said bumper moving means.

102. A garage comprising a trackway for an automobile, a bumper located normally in a depressed position on said trackway and adapted to be elevated into a position in front of a rear wheel of said automobile, a trip member mounted adjacent said trackway, means controlled by said trip member for elevating said bumper, and means actuated by the passage of a front wheel of said automobile thereover for operating said trip member and thereby elevating said bumper into the path of said rear wheel.

103. A garage comprising a trackway for an automobile, a bumper located normally in a depressed position on said trackway and adapted to be elevated into a position in front of a rear wheel of said automobile, a trip member mounted adjacent said trackway, means controlled by said trip member for elevating said bumper, means actuated by the passage of a front wheel of said automobile thereover for effecting an initial movement of said trip member, and other means actuated by the passage of said front wheel thereover for effecting a final movement of said trip member and a resulting actuation of said bumper moving means.

104. A garage comprising a trackway for an automobile, a bumper located normally in a depressed position on said trackway and adapted to be elevated into position in front of a rear wheel of said automobile, a trip member mounted adjacent said trackway, means controlled by said trip member for elevating said bumper, means actuated by the passage of the front wheel of said automobile thereover for operating said trip member and thereby elevating said bumper into the path of said rear wheel, means associated with the said bumper moving means for gradually restoring said bumper to its depressed position, and means for restoring said trip member to its normal position.

105. A garage comprising a trackway for an automobile, a bumper mounted adjacent said trackway and adapted to be elevated to a position in front of a wheel of said automobile, means tending normally to hold said bumper in its depressed position, a compressed air cylinder having a piston therein, means forming an operative connection between said piston and said bumper for elevating said bumper, means for admitting compressed air to said cylinder, and means actuated by the passage of a wheel of said automobile thereover on said trackway for controlling said air admission means.

106. A garage comprising a trackway for an automobile, a bumper mounted adjacent said trackway and adapted to be elevated to

a position in front of a wheel of said automobile, means tending normally to hold said bumper in its depressed position, a compressed air cylinder having a piston therein, means forming an operative connection between said piston and said bumper for elevating said bumper, means for admitting compressed air to said cylinder, means actuated by the passage of a wheel of said automobile thereover on said trackway for controlling said air admission means, and means actuated by the elevation of said bumper for closing said air admission means and permitting the escape of the compressed air from said cylinder.

107. A garage comprising a plurality of floors, an elevator shaft, an elevator car having a platform to receive an automobile from one of said floors, a storage rack on another of said floors, means for raising said elevator car, means for raising one end of said elevator platform with the other end stationary to move said automobile therefrom onto said storage rack, and means for raising one end of said storage rack with the other end thereof stationary to return said automobile therefrom onto said elevator platform.

108. A garage comprising a platform to receive an automobile, a gate for closing the entrance to said platform, means for actuating said platform to move said automobile therefrom, and means actuated by the movement of said platform for operating said gate to open the entrance to said platform.

109. A garage comprising a plurality of floors including an entrance floor, an elevator shaft, an elevator car for transferring automobiles from one floor to another, a storage table on one of said floors having a plurality of storage spaces, means for indicating on said entrance floor the storage spaces which are occupied, means controlled from said entrance floor for shifting said table to position an occupied storage space opposite said elevator shaft, and means for moving an automobile from said occupied storage space into said elevator car.

110. A garage comprising a plurality of storage spaces for storing automobiles stationarily, and indicating means for giving a permanent indication showing which of said spaces are occupied and unoccupied by automobiles.

111. A garage comprising a plurality of floors including an entrance floor, said floors having a plurality of storage spaces for automobiles, and indicating means on said entrance floor for showing which of said storage spaces on another floor are occupied by automobiles.

112. A garage comprising a plurality of floors including an entrance floor, an elevator shaft, an elevator car movable in said shaft and adapted to receive an automobile from said entrance floor, a storage table for a plurality of automobiles on another of said floors, indicating means for showing which parts of said storage table are occupied by automobiles, and means for shifting said table to position any selected part thereof opposite said elevator shaft.

113. A garage comprising a plurality of floors including an entrance floor, a plurality of parallel automobile runways on said entrance floor, curbs separating adjacent runways and a series of elevator shafts each located in alignment with one of said runways, said elevator shafts being arranged in rows spaced apart longitudinally of said runways with certain of said runways extending between the elevator shafts in one row.

114. A garage comprising a plurality of storage spaces for automobiles, means for moving automobiles to said storage spaces, means for selectively determining the storage space to be occupied by a particular automobile, and indicating means actuated by the operation of said selecting means for showing which storage spaces are occupied by automobiles.

115. A garage having a loading platform, an elevator operating in an elevator shaft, a series of movable storage racks, means independent of the power of an automobile for moving said automobile from the loading platform to the elevator, means for selectively positioning the storage racks adjacent the elevator shaft, and means independent of the power of the automobile for moving the automobile from the elevator onto the selected storage rack.

116. A garage having a storage platform, an elevator operating in an elevator shaft, a series of movable storage racks, means independent of the power of an automobile for moving said automobile from the loading platform onto the elevator, means for automatically stopping said automobile on the elevator and blocking it in position, means for selectively moving the storage racks adjacent the elevator shaft, and means for moving the automobile from the elevator onto the selected storage rack.

117. A garage having a loading platform, an elevator operating in an elevator shaft, a series of movable storage racks, means for moving the loading platform to cause an automobile on it to run onto the elevator by gravity, means for selectively positioning the storage racks adjacent the elevator shaft, and means for moving portions of the elevator to cause the automobile to run onto the selected storage rack by gravity.

118. A garage having a series of movable storage racks, an elevator operating in an elevator shaft, a discharge runway, means for selectively moving the storage racks adjacent the elevator shaft, means independent of the power of an automobile for moving said automobile from the selected storage

rack onto the elevator, means for lowering the elevator, means independent of the power of the automobile for moving said automobile from the elevator onto the discharge runway, and means for automatically stopping the automobile in said runway.

119. A garage having a loading platform, a normally locked operating means therefor, and means operated by an automobile as it moves onto the loading platform for automatically unlocking the operating means.

120. A garage having a loading platform, a normally locked operating means therefor, a normally open gate for closing the entrance to said platform, and means operated automatically by an automobile as it moves onto the platform for unlocking the locking means and closing the gate behind the automobile.

121. A garage having an elevator operating in an elevator shaft between different floors, doors opening from said elevator shaft to the floors of said garage, means operating independently of the power of an automobile for moving said automobile from the elevator to said garage floors, and means for preventing operation of said automobile moving means until the door from the elevator shaft to the selected floor has been completely opened.

122. A garage having an elevator operating in an elevator shaft between different floors, doors for closing the openings from said elevator shaft to said floors, a tilting platform carried by said elevator shaft, means for tilting the platform to run an automobile off the elevator onto the garage floors, and means for preventing operation of said tilting means until the door from the elevator shaft to a selected floor has been completely opened.

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