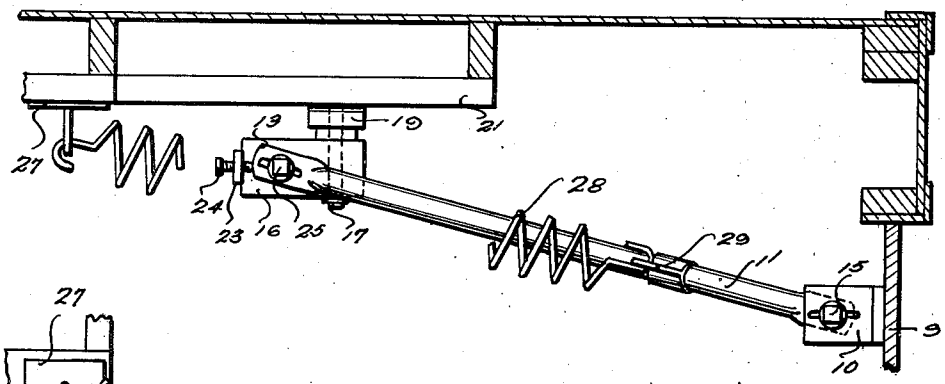
Aug. 19, 1947. A. E. VIOLANTE 2,425,905

OVERHEAD AND SWINGABLY MOUNTED BALANCED DOOR

Filed Dec. 1, 1944 2 Sheets-Sheet 1

Fig. 1.



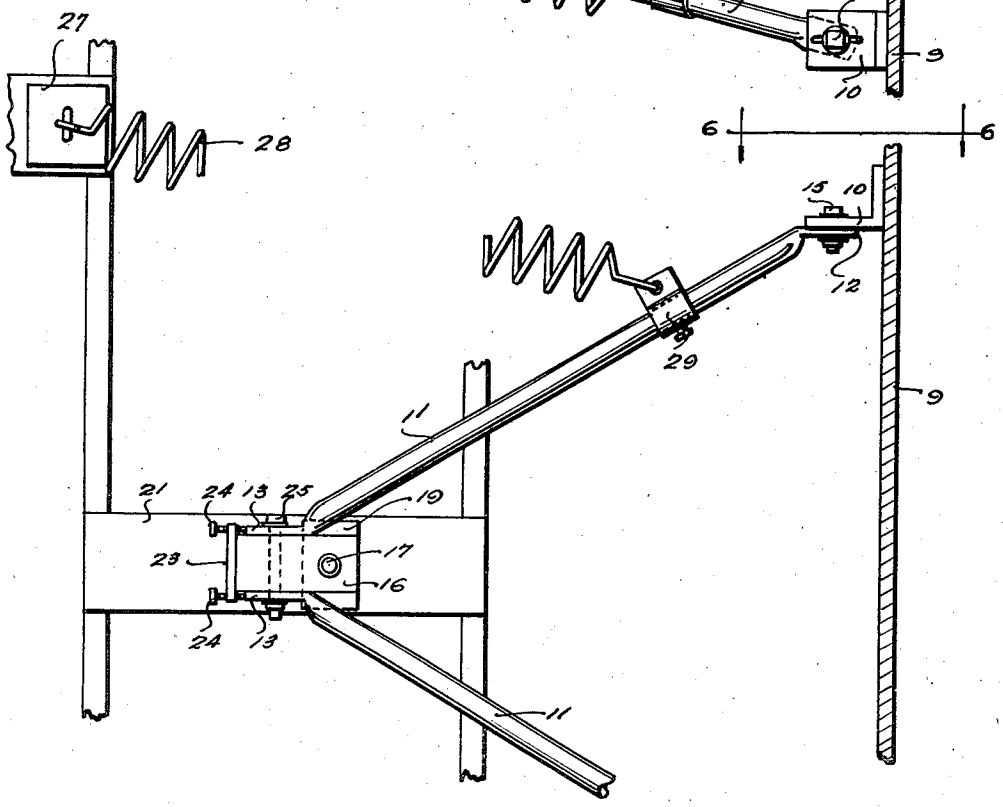


Fig. 2.

Inventor

Anthony Eugene Violante,

By Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

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OVERHEAD AND SWINGABLY MOUNTED BALANCED DOOR

Filed Dec. 1, 1944 2 Sheets-Sheet 2

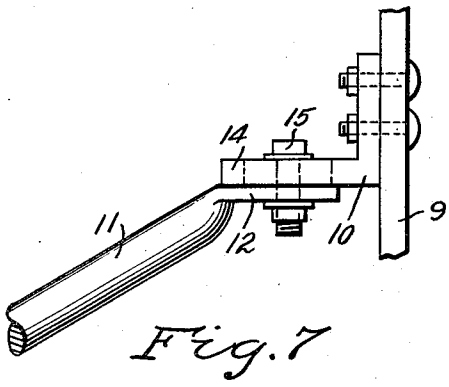
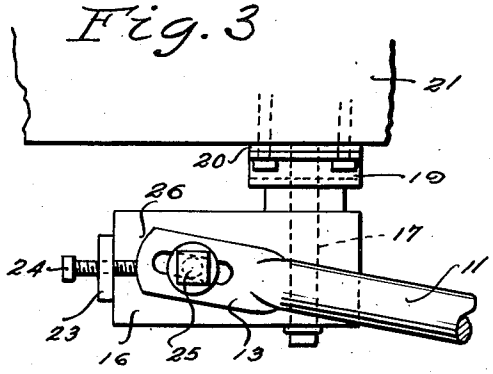


Fig. 7

Fig. 3



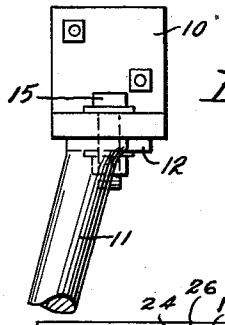


Fig. 8

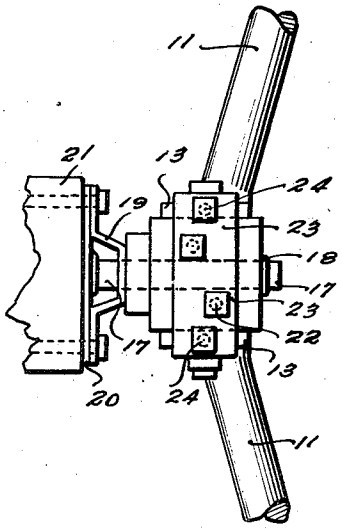


Fig. 4

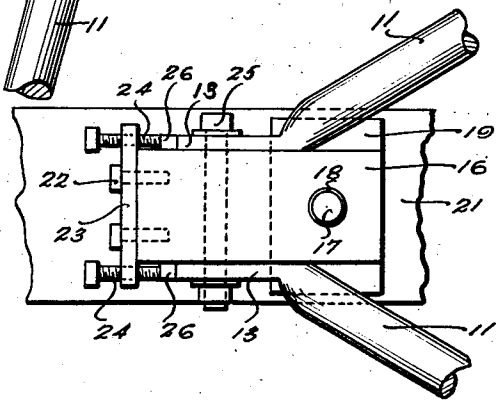


Fig. 5.

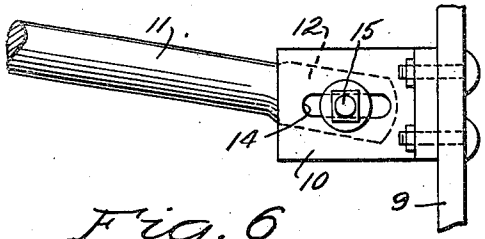


Fig. 6

Inventor

Anthony Eugene Violante,

By Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

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OVERHEAD AND SWINGABLY MOUNTED BALANCED DOOR

Anthony Eugene Violante, Detroit, Mich.

Application December 1, 1944, Serial No. 566,089

3 Claims. (Cl. 20—16)

1

This invention relates to closures broadly and has more specific reference to heavy duty doors of the balanced, swingably mounted type usable in garages and elsewhere, particularly where space is restricted and ease and expediency of operation is a factor of primary consideration.

In reducing the invention to practice, I have evolved and produced novel and practicable suspension and operating means possessed of numerous refinements and improvements such as will be hereinafter revealed.

In carrying out the principles of the invention, I have adopted and chosen for use an arrangement of relatively simple and feasible coacting parts such as prevent sagging, warping and binding.

In addition to being extremely simple and durable in construction and susceptible of ready manufacture and installation, the means employed completely obviate the use of rails, pulleys, weights and troublesome cables.

Aptly fitted for the purposes intended, the structural means utilized provides for precision adjustment of the companion parts, making it possible to obtain perfect balance for any weight of door within reason. Thus, a structural adaptation is had which assures easy, smooth and continuous operation, this with requisite facilities for quiet functioning and opening and closing with the slightest effort.

Other features and advantages will become more readily apparent from the following description and accompanying illustrative drawings.

In the drawings, wherein like numerals are employed to designate like parts throughout the views:

Figure 1 is a fragmentary horizontal and elevational view showing, in top plan, the door mounting, suspension and operating means as constructed in accordance with the principles of this invention.

Figure 2 is a side elevational view of the same.

Figure 3 is an enlarged fragmentary top plan view of the off-center hinge block, the adjustable mount for the converging arms.

Figure 4 is an end view of Figure 3 observing same in a direction from left to right.

Figure 5 is a face or side elevational view of

2

Figure 4 observing same in a direction from right to left.

Figure 6 is an enlarged detail view taken approximately on the plane of the line 6—6 of Figure 2, looking in the direction of the arrows.

Figure 7 is an enlarged "close-up" of the door bracket and associated arm as shown at the right in Figure 2.

Figure 8 is an end view of the door bracket seen in Figure 6 and observing same from left to right.

By way of introduction to the detailed description, it is to be pointed out that the door mounting and suspension and operating means is the same on each end of the door. Therefore, a description of one assemblage will suffice for both. I direct attention, first, to Figure 2, wherein the door 9 is provided at the desired point with an angle or L-shaped bracket 10. This is bolted or otherwise secured in place, as shown in Figures 6 and 7. The hanger and operating arms are denoted by the numerals 11, these being rods of a predetermined length having their outer ends flattened and bent laterally, as indicated at 12, and their opposite inner ends likewise bent laterally and flattened, as indicated at 13. As shown in Figures 6, 7 and 8, the horizontal leaf or limb of the bracket is provided with an elongated slot 14 and a bolt and nut connection 15 coacts therewith and with the arm extension 12 to provide the desired pivoting and in-and-out jointing connection.

I call attention now to the pivotal hub structure, the means for adjoining the two converging ends of the arms 11 and affording the desired up-and-over movement of the door 9. This is characterized by a substantially rectangular block 16, said block provided with a hinge pintle 17 retained at its outer end by a snap ring 18. As brought out in Figure 5, this pintle extends through the block between the center and one end thereof. It is journaled for rotation in a substantially U-shaped bearing bracket 19 (see Fig. 4) bolted to a foundation clip or plate 20, the parts 19 and 20 being mounted on a supporting beam 21 provided therefor. The inner end of the hinge pintle has end thrust rotatable contact with the intermediate portion of the wear plate 20. Secured (see Fig. 5) to the left hand end of the hinge block 16 by fastenings 22 is an adapter

plate 23 of general rectangular form which has its upper and lower ends projecting above the upper and lower surfaces of the block, these being provided with set screws 24. An assembling and adjusting bolt, with clamping nut means, is indicated at 25, and this extends vertically through the block when it is horizontal, as shown in Figure 5, to accommodate the slotted, flattened slotted ends 13 of the arms. The rear ends 26 are of arcuate form to accommodate the set screws, as seen better in Figure 3. It will be observed that the slotted bolt and nut connection between said flattened ends and block is provided off center, this to obtain the desired facility of coacting operation of the parts.

I next call attention to a suitable bracket or fixture 27 for anchorage of one end of the coiled spring 28. The opposite end of the spring is attached to a collar 29 fastened on the intermediate portion of the rod.

The diverging arms 11 coact with the hinge block in providing a substantially V-shaped yoke, the vertex of the yoke being hingedly mounted on the stationary support 21. The arm connections at this point are adjustable. The outer ends of the arms are adjustably connected with the brackets 10 fastened on the inner surface of the door 9. Thus, we have a simple V-shaped yoke including a hinge block mount, adjustable connections between the outer ends of the arms of the yoke and the door, and spring balance means, as is evident.

At this point I would stress the following seemingly important advantages:

(*a*) A sideways adjustment, as well as an in-and-out adjustment, is provided for the hinge arms by the elongated slot in the arm bracket connection between same and the door. Note this in-and-out adjustment is distinctly at ninety degrees to the face of the door. This minimizes repeated arm bracket shifting on the door itself.

(*b*) An additional sideways and an in-and-out adjustment is provided for by the elongated slots in the arm, where it is clamped in the pivot or hinge block. Further, adjusting screws are provided to take care of and compensate for this in-and-out adjustment at the pivot block.

(*c*) An improved balancing condition of the door is secured by adjustably clamping hinge arms to the pivot block off center.

(*d*) The pivot pin is held securely to the pivot pin block, welded or otherwise, so that the pivot pin cannot rotate in respect to said block.

(*e*) The pivot block is mounted on the pivot pin and spaced properly by a spacer, and held securely in location by a snap ring. (Grooves for same provided in pivot pin.)

(*f*) A balancing spring is attached and anchored on the building wall by a spring base bracket. The other end of the spring is attached to the upper hinge arm by a collar clamp. Shifting of this clamp up or down increases or decreases the spring tension, as required. This spring provides an additional balancing means necessary to open the door with ease.

Regarding the refinement of the in-an-out adjustment at ninety degrees to the face of the door, the position of the door in relation to the pivot position can be changed to suit any requirement, and it will not be necessary to relocate the arm brackets, as is the case on all other door hinges. It is well to note that the adjustment on all other doors is on the arms in such a manner that if an adjustment is made it is angular movement away from and up from the hinge pivot, all at the same time. If, after a reasonable movement, it then becomes necessary to re-locate the arm brackets, this is the very thing that my design has overcome.

Although the invention is shown and described primarily as an overhead garage door, movable from a perpendicular position to an overhead horizontal position and out and back again, it is obvious that it may serve many other uses where swinging, spring balanced doors are considered practicable for use.

The adjustable side arm brackets fit varying construction problems in limited spaces and make for easy and efficient installation at less cost.

With this construction the full weight of the door is rigidly supported on the two outside walls of the building, eliminating settlement, rubbing or binding in the operation of the door. What is more, the construction and arrangement is sufficiently adjustable and adaptable to accommodate itself to most garages without special construction.

A careful consideration of the foregoing description in conjunction with the invention as illustrated in the drawings will enable the reader to obtain a clear understanding and impression of the features of merit and novelty sufficient to clarify the construction of the invention as hereinafter claimed.

Minor changes in shape, size, materials and rearrangement of parts may be resorted to in actual practice so long as no departure is made from the invention as claimed.

I claim:

1. In a structure of the class described, a building wall, a block, means for pivotally connecting the block on the wall at a point between its center and one of its ends, a pair of duplicate arms secured to the door and having flattened slotted portions resting on the upper and lower surfaces of said block at points between the center and the opposite ends of the block, a bolt passing through the slotted portions of the arms and the block to transmit the load of the door to the block at a point beyond the center of the block, spring means connected to an intermediate portion of an arm, and an adjustable connection between the outer ends of said arms and the door.

2. As a component part of a door hanger and suspension device of the class described, a substantially rectangular block provided between its center and one end with a hinge pintle, a bearing bracket including an end thrust plate, said hinge pintle being mounted in said bearing bracket and resting in contact with said end thrust plate, a pair of arms having flattened and slotted ends, an adapter plate secured to the end of the block remote from the hinge pintle, and separate manually operable means between the adapter plate and each of said pair of arms whereby the position of the end of each arm relative to the block can be varied to change the vertically adjusted position of the door and the load of the door may be transmitted to the block at a point beyond the hinge pintle.

3. As a component part of a door hanger and suspension device of the class described, a substantially rectangular block provided between its center and one end with a hinge pintle, a bearing bracket including an end thrust plate, said hinge pintle being mounted in said bearing bracket and resting in contact with said end thrust plate, a pair of arms having flattened ends, said

flattened ends being slotted and being adjustably bolted to the upper and lower surfaces of the block, and said block being provided with set screws at its end remote from the hinge pintle engageable with the adjacent extremities of the flattened slotted ends of the arms whereby the longitudinally adjusted position of each arm relative to the rectangular block may be selectively adjusted, and the load of the door may be transmitted to the block at a point beyond the hinge pintle.

ANTHONY EUGENE VIOLANTE.

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