My invention relates to overhead doors, such as used for garages, and the like.

One of the principal objects of this invention is to provide an overhead door, which may be shifted from a closed vertical to an open overhead horizontal position substantially without any part thereof being raised, at any time during such shifting, above such horizontal position.

An important object of the invention is to provide a novel and relatively simple lever and link mechanism for effecting such result.

Another important object of this invention is to provide a door of this class which may be relatively easily shifted from a closed to an open position, or from the latter to the former positions, and also a door of this class which may be resiliently held in either position.

An important object also of this invention is to provide lever and link mechanism for a door of this class which may be readily adjusted to different sizes of doors.

A further important object of this invention is to provide lever and link mechanism for doors of this class which may be readily installed.

With these and other objects in view, as will appear hereinafter, I have devised a door construction having certain novel features of construction, combination, and arrangement of parts and portions, as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawings and to the characters of reference thereon, which form a part of this application, in which:

Fig. 1 is a cross-sectional elevational view of a door and door frame with the door in a closed position, and showing a lever and link means for supporting the door on the frame so that the same may be shifted from a vertically closed to a horizontal open position, and showing by various dash, dot-and-dash, and dotted lines, the door, and lever and link means in various shifted positions;

Fig. 2 is an inner side view of one edge of the door and frame, and the lever and link mechanism for supporting one side of the door on the frame; and,

Fig. 3 is a sectional view, taken through 3—3 of Fig. 1, showing a pivotal mounting of the door on the frame.

The structure of my invention, as illustrated in the drawings, is applied directly to an overhead door as used for garages, and the like. Here the door frame, designated 1, is shown fragmentarily in Figs. 1, 2, and 3, and the door is designated 2. In an upright or vertically closed position, the upper end of the door engages a jamb 4.

The lever and link mechanism of my invention consists of a master lever 11, guide levers 12 and 13, and a guide link 14. Such lever and link mechanism is duplicated at the opposite lateral sides of the door and door opening, but only one is shown in the drawings.

At the inner side of the frame, and substantially at the middle portion between its lower and upper ends is a bracket 15, which extends considerably inwardly from the plane of the door, when in its closed position. The lever 11 is pivoted near one end, on the inner end of the bracket 15. To the inner side of the lever 11 is secured an elongated hinge member 16 which effects, at its median portion, the pivotal mounting upon the bracket 15. The member 16 constitutes substantially a reinforcement on the lever 11 and provides a relatively wide offset face against the bracket 15. The normally lower end 11'a of this lever is pivotally mounted on a bracket 17 at the lower end of the door.

Thus the door 2 is pivotally supported at its lower end on or with respect to the bracket 15, that is, by means of the lever 11. The door is swung about pivotal axes through the brackets 15 and 17 to a horizontal position at the upper end of the door opening with its normally lower end substantially flush with the building wall in which the frame is provided. The shifting or swinging of the door to its open position is determined or controlled by the guide means comprising the levers and link 12, 13, and 14. The lever 12 is pivotally mounted at one end on a bracket 18 at or near the upper end of the side of the frame. One end of the lever 13, which is considerably shorter, is pivotally connected at one end to the bracket 19 provided at the inner side of and intermediate portion of the door 2. The link 14 is pivotally connected at one end to the pivotal connections of the lever 11, and preferably nearer the pivotal mounting of the lever on the bracket 15. These levers and link 12, 13, and 14, are pivotally connected, as shown in Figs. 1 and 2.

The initial opening of the door, which is or may be initiated by a grip 20, causes the door to be shifted to the dotted line position designated A. The dotted line positions designated, respectively, B, C, and D, indicate progressively farther open positions. It will be here noted that the upper end of the door, in being shifted from a closed to its open position, is not materially raised above its normally upper end when
in a closed position, as shown clearly in Fig. 1. The door, when shifted to its completely open position, assumes a substantially horizontal position, as indicated by E, and it is then raised to the upper positions designated F and G, respectively. The upper and ultimate position, designated G, is substantially against and may be limited by the jamb I. The positions of the levers and link 12, 13, and 14, corresponding to the last three positions of the door 2, are also designated E, F, and G.

To facilitate the opening of the door, I have provided a spring 21, which is secured at its lower end to a bracket 22 secured to the lower portion of the inside of the frame, and at its upper end to the end 11 of the lever, which is extended above or beyond its pivotal mounting on the bracket 15. The connection to the latter end of the lever 11 is by means of a bracket 23, which extends from the lever 11 to the side of the door.

Though I have shown and described a particular construction, combination, and arrangement of parts and portions of my overhead door, and have limited my description and claims to an application to an overhead garage door, I do not wish to be limited to the same, but desire to include in the scope of my invention the construction, combination, and arrangement substantially set forth in the appended claims.

I claim:

1. A mechanism of the class described for supporting a door on a frame, comprising: a guiding lever adapted to be pivotally connected at one end to the upper portion of the side of the frame; a master lever adapted to be pivotally connected at one end thereof to the middle portion of the frame inwardly from the guiding lever pivot, the other end of the master lever being adapted to be pivotally connected to the lower portion of the inner side of the door and being pivotally connected to the other end of the guiding lever.

2. A mechanism of the class described for supporting a door on a frame, comprising: a guiding lever adapted to be pivotally connected at one end to the upper portion of the side of the frame; a master lever adapted to be pivotally connected at one end thereof to the middle portion of the frame inwardly from the guiding lever pivot, the other end of the master lever being adapted to be pivotally connected to the lower portion of the inner side of the door; a third lever adapted to be pivotally connected at one end thereof to the intermediate portion of the inside of the door and being connected at the other end thereof to the free end of the guiding lever; and means in connection with the master lever and the pivotal connection at the free end of the guiding lever for determining the position of said pivotal connection at the free end of the guiding lever with respect to the master lever and inwardly of the frame.

3. A mechanism of the class described for supporting a door on a frame, comprising: a guiding lever adapted to be pivotally mounted at substantially the middle of the upper and upper ends of the frame and inwardly from the plane of the door in its closed position, the lever being adapted to extend downwardly from its pivotal mounting and being adapted to be pivotally connected at its lower end to the inner edge of the lower end of the upper portion of the frame, and means pivotally connected to the intermediate portion of the master lever and adapted to be pivotally connected to the middle portion of the door and upper end of the frame, for guiding the swing-
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ing of the door to a horizontal position at the upper end of the frame.

8. A mechanism of the class described for supporting a door on a frame, comprising: a master lever adapted to be pivotally connected at substantially the median portion between the lower and upper ends of the frame and inwardly from the plane of the door in its closed position, the lever being adapted to extend downwardly from its pivotal mounting and being adapted to be pivotally connected at its lower end to the lower end of the door and substantially in the plane thereof; and lever and link guide means comprising two levers and a link, each being pivotally connected at one end to the other two, the other end of the link being pivotally connected to the intermediate portion of the master lever, and the other ends of the levers of said means being adapted to be pivotally connected, respectively, to the intermediate portion of the door and the upper end portion of the frame, the pivotally connected ends of the levers and link of said means being adapted to be located a considerable distance inwardly from the pivotal mounting of the master lever, said means being capable of guiding the swinging of the door to a horizontal position at the upper end of the frame.

9. A mechanism of the class described for supporting a door on a frame, comprising: a guiding lever adapted to be pivotally connected at one end to the upper portion of the side of the frame; a master lever adapted to be pivotally connected at one end thereof to the intermediate portion of the frame, the other end of the master lever being adapted to be pivotally connected to the lower portion of the inner side of the door, and a third lever adapted to be pivotally connected at one end thereof to the intermediate

portion of the inside of the door and being connected at the other end thereof to the other end of the guiding lever.

10. A mechanism of the class described for supporting a door on a frame, comprising: a continuous rigid lever adapted to be pivotally connected to said frame at the middle portion thereof and also adapted to be pivotally connected to lower portion of the door; a first series of elements comprising a second lever adapted to be pivotally connected to the upper portion of the frame; a third lever portion of said rigid lever; and a link pivotally connected to both said second lever and said first lever portion in such a manner that said first series is adapted to be connected at one end to the upper portion of the frame and at the other end to the middle portion thereof; and a second series of elements comprising a third lever adapted to be pivotally connected to the middle portion of the door, a second lever portion of said rigid lever, and said link being pivotally connected to both said third lever and said second lever portion in such a manner that said second series is adapted to be connected at one end to the lower portion of said door and the other end is adapted to be connected to the middle portion thereof.

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