2 Sheets—Sheet 1.

E. PRESCOTT.

Hanger for Doors, Gates, &c.

No. 196,990. **Patented Nov. 13, 1877.**

Fig. 1.

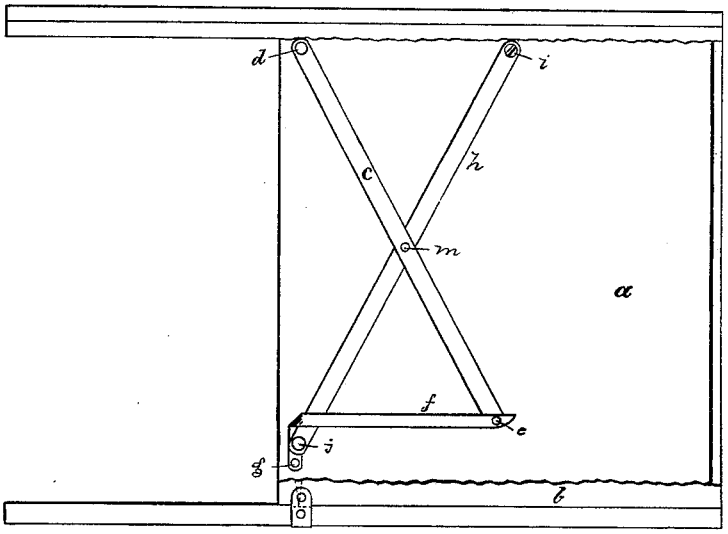
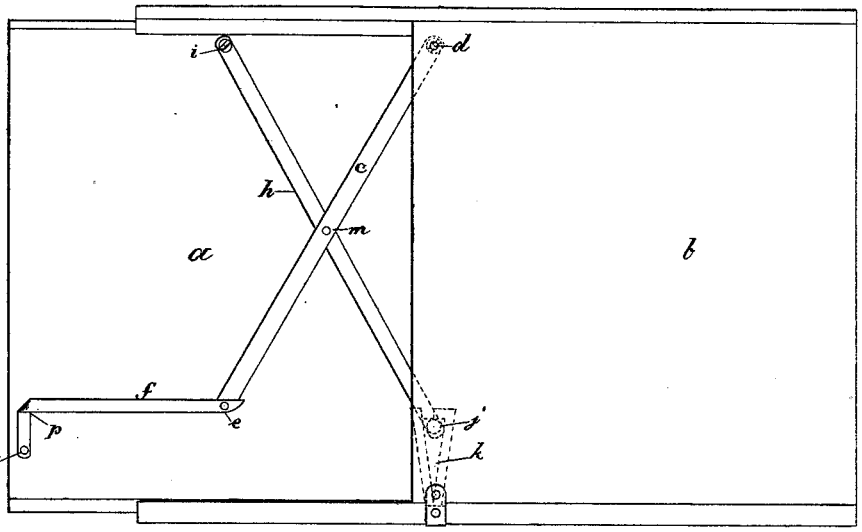


Fig. 2.



Witnesses.

W. G. Gratt,
E. C. Perkins

Inventor.

Edwin Prescott
per Crosby & Gregory Attys

2 Sheets—Sheet 2.

E. PRESCOTT.

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Fig. 4.

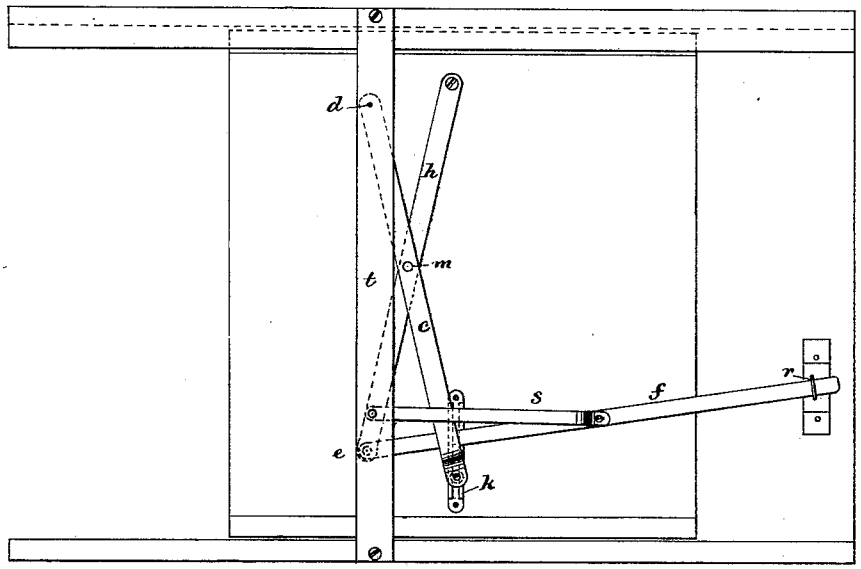
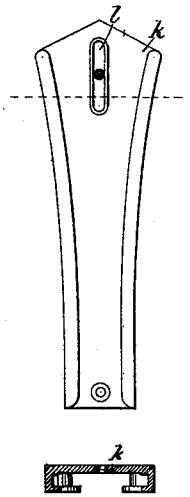


Fig. 3.



Witnesses

E. C. Perkins

W. J. Pratt.

Inventor.

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UNITED STATES PATENT OFFICE.

EDWIN PRESCOTT, OF HAMPTON FALLS, NEW HAMPSHIRE.

IMPROVEMENT IN HANGERS FOR DOORS, GATES, &c.

Specification forming part of Letters Patent No. **196,990**, dated November 13, 1877; application filed July 30, 1877.

To all whom it may concern:

Be it known that I, EDWIN PRESCOTT, of Hampton Falls, in Rockingham county, in the State of New Hampshire, have invented an Improvement in Hangers, of which the following is a specification:

This invention relates to improvements in hangers for doors, gates, &c., and is specially adapted for use in barns and on cars.

The object of my invention is to so hang a sliding door, gate, or equivalent, by means of levers arranged at one side thereof, that the said door may be moved equal distances in opposite directions from a stationary post or frame on which one end of one of the hanging levers of the door is connected, whereby doors of any usual width may be employed and moved easily.

In this invention one lever (the post-lever) is pivoted at one end (preferably its upper end) to a post or other fixed part of the building, while its other end is so connected with and guided as to move with and in a direction at right angles to the movement of the door, or substantially so, and at or near the center of the door. The other, or the door lever, is connected at one end (preferably its upper end) to the upper portion of the door, while its lower end is so connected with and guided as to move over the post in a direction substantially at right angles to the direction of movement of the door, and in the same vertical line in which the fixed pivot of the post-lever is located. These two levers are pivoted together at or near their centers, so as to cause the top and bottom of the door to move at substantially the same velocity, and the free ends of the levers are arranged and constructed so as to readily pass each other as the door is opened and closed.

Figure 1 represents one form of my invention with the door open, and Fig. 2 represents the same door closed, the view being taken from the inner side of the door; Fig. 3, a detail of the connection of the free end of the door with the post or stationary part. Fig. 4 represents a modified form of the invention, the door being partially closed.

In the drawing, *a* represents the door, arranged to be moved and steadied by suitable guideways at bottom and top, so as to remain in vertical position and prevent lateral motion to or from the building *b*, or a stationary post, with which the post-lever is connected.

The post-lever *c* is pivoted, as shown in Figs. 1 and 2, to the building *b*, or a post at *d*, and its lower end is pivoted at *e* to a radius-bar, *f*, connected with the door at *g*. The upper end of the door-lever *h* is shown as pivoted, at *i*, to the door *a*, and the lower end of said lever provided with a pin or stud, *j*, having, in practice, a friction-roller, which enters the slot of a guide, *k*, connected with the building, as in Figs. 1 to 3, and arranged in the same vertical plane with the pivot *d*. This guide, as shown in Fig. 3 in front view and cross-section, is preferably made of cast-iron, and provided with a slot, *l*, so that it may be raised or lowered on the building to regulate the extent of movement of the lower end of the door in each direction from the pivotal point of the post-lever.

As the friction-roller on the door-lever reaches the upper or wider portion of the guide, (the door being then opened or closed,) it, by reason of its bearing on the inclined side of the guide, acts to prevent the door from returning toward the pivotal point of the post-lever, or sagging back.

If the sides of the guide were simply vertical, the door would have a tendency to remain half-way open; but, by inclining the walls of the guide outward at top to a greater or less distance, the tendency of the door to remain partially open is overcome, and such door may consequently be placed and retained in any desired position.

The levers *h c*, in Figs. 1 and 2, are pivoted together at *m*, and above such point they are of equal length, so as to move the upper central portion of the door in substantially a straight line.

To permit the door to move each way past the pivotal point *d*, the lower end of the door-lever is made the longest, so that the pivotal point *e* of the lower end of the post-lever may pass between the stud *j* and the pivot *m*.

The radius-bar *f*, pivoted at *g*, so holds the lower end of the door that it moves at substantially the same speed as the upper portion of such door.

During the movement of the door, the lower

end of the post-lever moves substantially at right angles to the movement of the door, and the end of the radius-bar, connected with the post-lever, moves in the arc of a circle with reference to the edge of the door.

To move the door in as near a straight line as possible, the pivotal point *g* of the radius-bar must be located substantially half-way between the extremes of motion of the pivot *e* connected with the post-lever. To permit the stud to rise in the guide as the pivot *e* passes beyond it, the back end of the radius-bar is bent as at *p*.

This radius-bar might be made straight, and its pivotal point *g* be elevated, but this is not so well, for the door would not be moved in as straight a line.

The devices so far described may be employed to good advantage by placing the guide for the stud of the door-lever at the lower central portion of the door, and by connecting the angle end of the radius-bar to the side of the building, and as far back from the post as it now is from the middle of the door.

The devices shown in Figs. 1 and 2 may be used by reversing the levers end for end, and pivoting the door and post levers at their lower, rather than at their upper ends; but the first arrangement is preferred, as the tendency of the door to slam at the extremes of its motion is obviated.

In the modification, Fig. 4, the lower end of the post-lever is provided with the stud, and the guide is connected with the center of the door, so as to permit the passage between it and the door, and between the stud and the pivotal point of the crossing-levers, of the lower end of the door-lever and its connected radius-bar, the latter, in this instance, being made straight, with its outer end controlled by a guide, *r*.

The radius-bar is connected by a link, *s*, with a post, *t*, and insures the vertical movement of the pin connecting the end of the radius-bar and the lower end of the door-lever. In Fig. 4, the post is broken away opposite the end of the link.

If the radius-bar was pivoted, instead of being placed in a guide, then the link might be omitted.

This modification, Fig. 4, is preferred for inside doors. In this modification, if the ends of the two levers connected with the door were of the length of the portions of the levers between their pivots and the building, then the door would have a tendency to stop half-way open or half-way closed.

To obviate this difficulty, the ends of the levers from their crossing-point are of different lengths, the ends connected with the door being longest, thereby elevating the door to its highest position at the center of its longitudinal motion, and lowering it as the door reaches the end of its movement in each direction, the weight of the door preventing any back motion. This difference of length also permits the stud to be so placed that the door may be moved past the pivotal point of the upper end of the door-lever.

I claim—

1. The combination, with a door, of crossed levers pivoted at one end, one to the door and the other to the building, and connected at their other ends, one by a stud with a guide, and the other with a radius-bar, the joint of the radius-bar with one of the crossed levers being arranged to pass between the stud in the end of the other lever and the pivoted point of the two levers, substantially as described.

2. The combination, with a door, of pivoted crossed door and post levers, a stud, a guide, and a radius-bar, connected with each other and with the door and building, as described, whereby all the levers to sustain and project the door are arranged on the same side of the door, and all the points of connection are made within the space bounded by the bottom and top of the door, substantially as described.

3. The combination, with the door-lever and its stud, of a guide having sides arranged to co-operate with the stud, to assist in retaining the door in any desired position, substantially as described.

4. The combination, with one member of the pair of crossed levers, of a radius-bar bent or shaped to permit the bar to be connected with the lower portion of the door, at a point substantially midway between the highest and lowest points reached by the other end of the radius-bar in its movements, and to permit the passage of such other end of the radius-bar between the stud and the crossing-points of the two levers.

5. In combination, two pivoted crossed levers, one adapted at one end to be connected with a post or fixed part of a building, and to move at its other end substantially vertically with relation to a door, and the other adapted to be connected at one end with the door, and to move substantially vertically over the post or a fixed part of the building at the opposite side of the lever, the movable end of one lever being also arranged to pass between the pivotal point of the two levers and the connecting-point of the end of the other lever, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWIN PRESCOTT.

Witnesses:

JAS. H. BATCHELDER,

GEO. E. LANE.