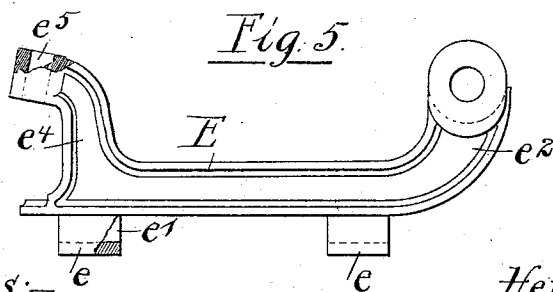
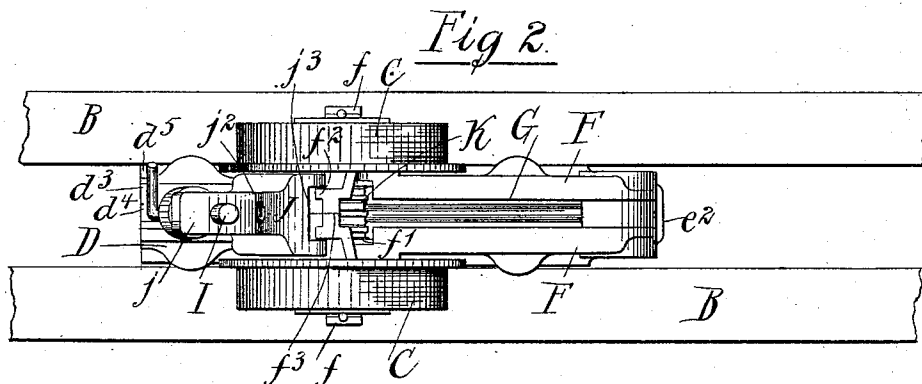
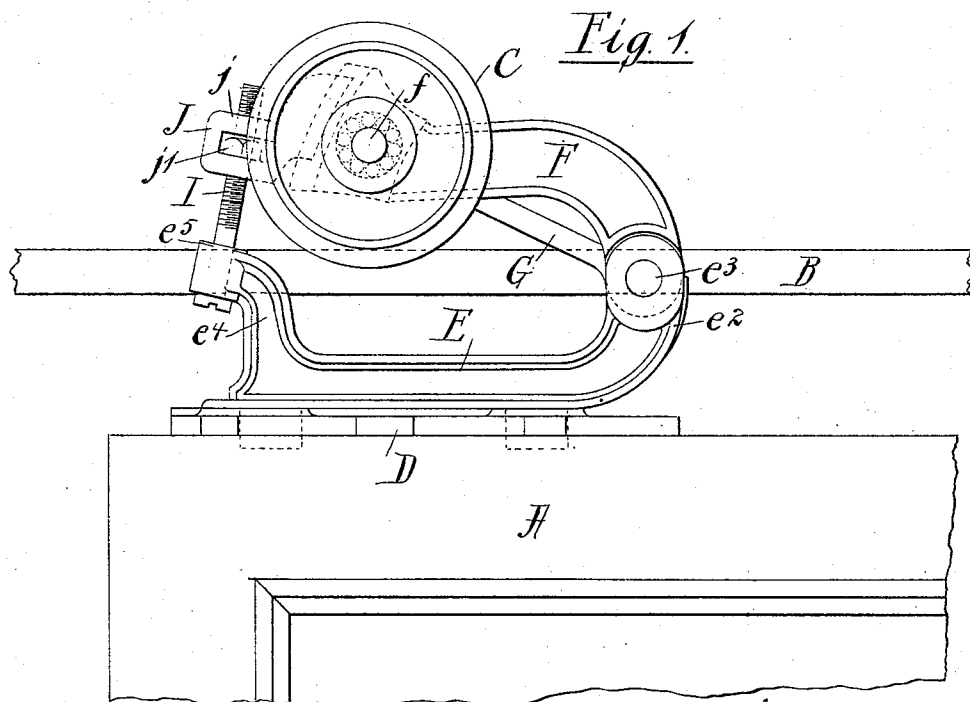


H. L. FERRIS.
DOOR HANGER.

No. 539,987.

Patented May 28, 1895.



Witnesses:
Clinton Hamilton
Jno. W. Adams.

Inventor:
Henry L. Ferris.
by: Dayton, Poole & Brown
his Attorneys.

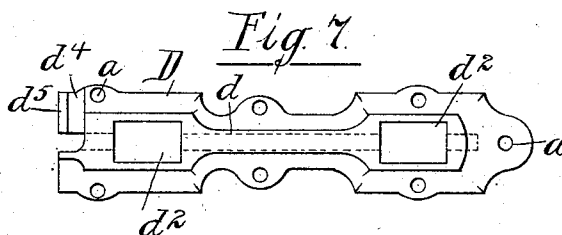
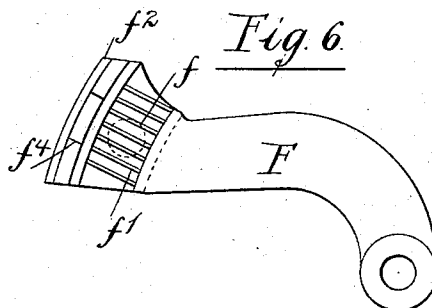
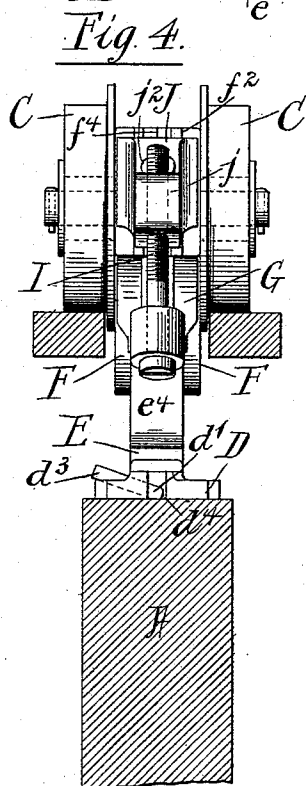
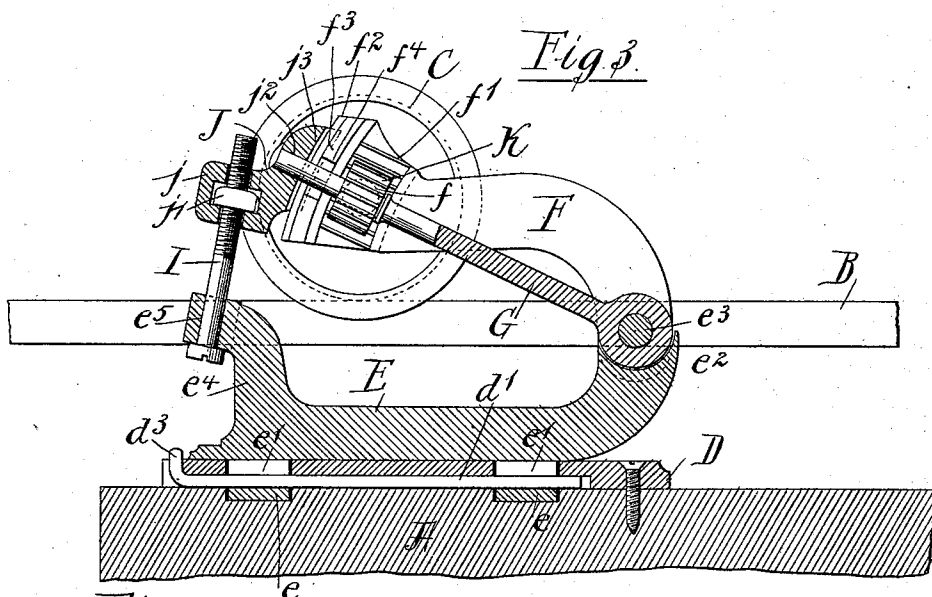
(No Model.)

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his Attorneys.

UNITED STATES PATENT OFFICE.

HENRY L. FERRIS, OF HARVARD, ILLINOIS, ASSIGNOR TO HUNT, HELM & FERRIS, OF SAME PLACE.

DOOR-HANGER.

SPECIFICATION forming part of Letters Patent No. 539,987, dated May 28, 1895.

Application filed April 18, 1894. Serial No. 507,962. (No model.)

To all whom it may concern:

Be it known that I, HENRY L. FERRIS, of Harvard, in the county of McHenry and State of Illinois, have invented certain new and useful Improvements in Door-Hangers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to that class of devices known as door hangers, adapted for supporting a sliding door from the top, and wherein the wheels of the device run upon horizontally arranged rails or tracks positioned above the door. It relates more especially to that class of door hangers having a part secured to the top of the door that is adapted to engage with the other part of the door hanger, the latter having engagement with the said supporting wheels.

One of the objects of the invention is to provide means whereby the inequalities of adjustment existing when the hanger is first applied, or which may result from the settling of the house or from other causes, will be obviated, and whereby the door will at all times hang perfectly true and operate smoothly. Simplicity of construction is also aimed at; and to these ends, the invention consists in the novelty of construction and combination of devices herein illustrated and described, and more particularly pointed out in the appended claims.

In the drawings I have illustrated, in Figure 1, a side view of my improved door-hanger as it appears attached to a section of the door and showing, also, one of the supporting-rails. Fig. 2 is a plan view of the same. Fig. 3 is a longitudinal sectional view of the parts shown in Fig. 1. Fig. 4 is an end view looking at what I call the front end of my hanger. Figs. 5, 6, and 7 are detailed views of the parts of the hanger which will be hereinafter more fully described.

In said drawings A designates the door; B B, two horizontal track rails, preferably of wood, secured in any convenient manner above the door in position to support the wheels or rollers C C of the hanger; said rails

having a space between them within which the hanger depends.

D designates a plate adapted to be rigidly secured upon the top of the door A, preferably by screws inserted through apertures *a* therein. A longitudinal groove *d* is formed in the under side of said plate adapted to receive a rod *d'*.

Rectangular apertures *d² d²* are formed through the plate D within which fit lugs *e e* provided on the under face of the main base plate E of the hanger. These lugs are provided with longitudinally arranged apertures *e' e'* which register, when the parts E and D are placed together, with the groove *d* and serve when the rod *d'* is inserted in said groove *d* and apertures *e' e'*, to lock the parts securely together. In order to retain the rod in position it is provided at one end with a right angled bent portion *d³* which when standing in a vertical position may enter a slot *d⁴* in the end of the plate D, after which it is turned down and rests behind a lug or stop *d⁵* thus preventing it from slipping out unless raised to a vertical position.

The base plate E of the hanger is provided at one end with an upturned end portion *e²* bifurcated for the reception of the ends of two roller bearing arms F F and an interposed pinion arm G, all of said parts being movably secured together on said plate E by means of a pivot pin *e³* which passes transversely through the part *e²* thereon and through suitable apertures in the arms F F and G. At its opposite end the base plate E is provided with a second upright portion *e⁴* curved outwardly at its upper end and provided with an obliquely disposed bolt aperture *e⁵*. The arms F F are somewhat shorter than the part E and are curved as shown more clearly in Fig. 6. At its forward or moving end, each of said arms F F is provided with a roller bearing stud or axle *f* projecting horizontally outward at right angles to the vertical longitudinal plane of the hanger, upon which axles *f f* are mounted the supporting wheels C. Preferably the wheels will be provided with anti-friction rollers of any approved construction interposed between the wheels and their axles.

The arms F are adjustably supported at their forward ends by means provided as fol-

lows: A bolt I passing upward through the aperture e^5 has engagement at its upper end with a casting J. The bolt I passes loosely through a projecting part j of said casting and through a rectangular opening therein, within which opening is arranged a nut j' with which said bolt has screw threaded engagement. By turning the bolt I the part J is drawn nearer to or forced away from the base plate E, according to the direction in which the bolt is turned, the sides of the rectangular opening within which the nut j' is placed preventing it from turning therein. The forward end of the pinion arm G is extended through and secured within an aperture j^2 in said part J. The arm G is provided approximately opposite the axles with a pinion K which is loosely mounted thereon and is engaged on opposite sides by rack teeth $f'f'$, that preferably, (and as shown in the present instance,) are cast integral with said arms F. In order that said rack portions may be held against and in mesh with the pinion K they are provided at their outer ends with segmental guide ribs or flanges f^2f^2 which have a sliding engagement with a segmental groove or way j^3 formed in the rear face of the casting J. The proximate faces f^3f^3 of the guide flanges f^2 rest against and have sliding engagement with each other at each end, but are each cut away or recessed at their middle portions f^4f^4 so as to provide room sufficient in width for clearance past the pinion shaft G and in length to permit a sufficient oscillatory movement of said arms F F in each direction.

Constructed as above described, it will be obvious that turning the screw bolt I in one direction or the other will draw together or force apart the arms and supporting wheels as a whole and the part E, thus raising or lowering the suspended door bodily as desired. The engagement of the pinion with the racks on either side thereof is such that when the wheels rest upon rails of equal level the centers of their respective axles and of the pinion will also be in the same horizontal plane. If in traveling along the rails one of the supporting wheels passes over a "high" place that wheel will be free to rise over it while the opposite wheel will, by reason of its engagement with the opposite side of the pinion, be caused to drop a corresponding distance, so that if the average of the two rails is right the door will be carried along exactly true. In following a depression the action will, of course, be reversed, so that regardless of how much one rail is "down" or the other "up" so long as the difference in the rails is less

than the limit of oscillation of the two wheel arms, this difference will be equalized by the relative movement of the two wheels.

It is a well known fact that by continued use depressions and high places will form in rails over which wheels travel, no matter how well leveled and true when put in place. This is especially true of wooden rails such as are commonly used with door hangers. Moreover, it frequently happens that rails perfectly true and level when first put in position, become warped because of improper seasoning of the material of which they are constructed or become crowned or sagged by the settling of the building or other structure. By the use of my improved hanger even traveling of the door from these causes is obviated. I do not, therefore, desire to be limited to details of construction as it is obvious that numerous modifications may be made without departing from the spirit of the invention.

I claim as my invention—

1. A door hanger provided with a base, roller supporting members movably mounted on said base, toothed racks on said members and an oscillatory pinion journaled between said racks in engagement therewith, substantially as described.

2. A door hanger comprising a base adapted to be secured to a door and carrying a rocking pinion mounted upon a longitudinally arranged axis, and roller supporting arms pivotally secured at one end to said base and provided on their proximate sides with racks engaging opposite sides of said pinion, substantially as set forth.

3. A door hanger comprising a base adapted to be secured to a door, a longitudinally arranged arm pivotally secured at one end to said base, a guide casting engaging the other end of said arm, a screw threaded bolt secured in said base and adjustably engaging said guide casting, a pinion mounted to oscillate on said arm, roller supporting arms pivoted to the base and provided on their proximate faces with rack teeth engaging opposite sides of said pinion, and guide flanges on the ends of said roller supporting arms, engaging guide grooves formed in said casting, substantially as set forth.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

HENRY L. FERRIS.

Witnesses:

J. L. KINSON,
N. N. TURNER.