No. 618,617. Patented Jan. 31, 1899.

W. K. RAIRIGH.

SLIDING DOOR.

(Application filed Mar. 18, 1898.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.

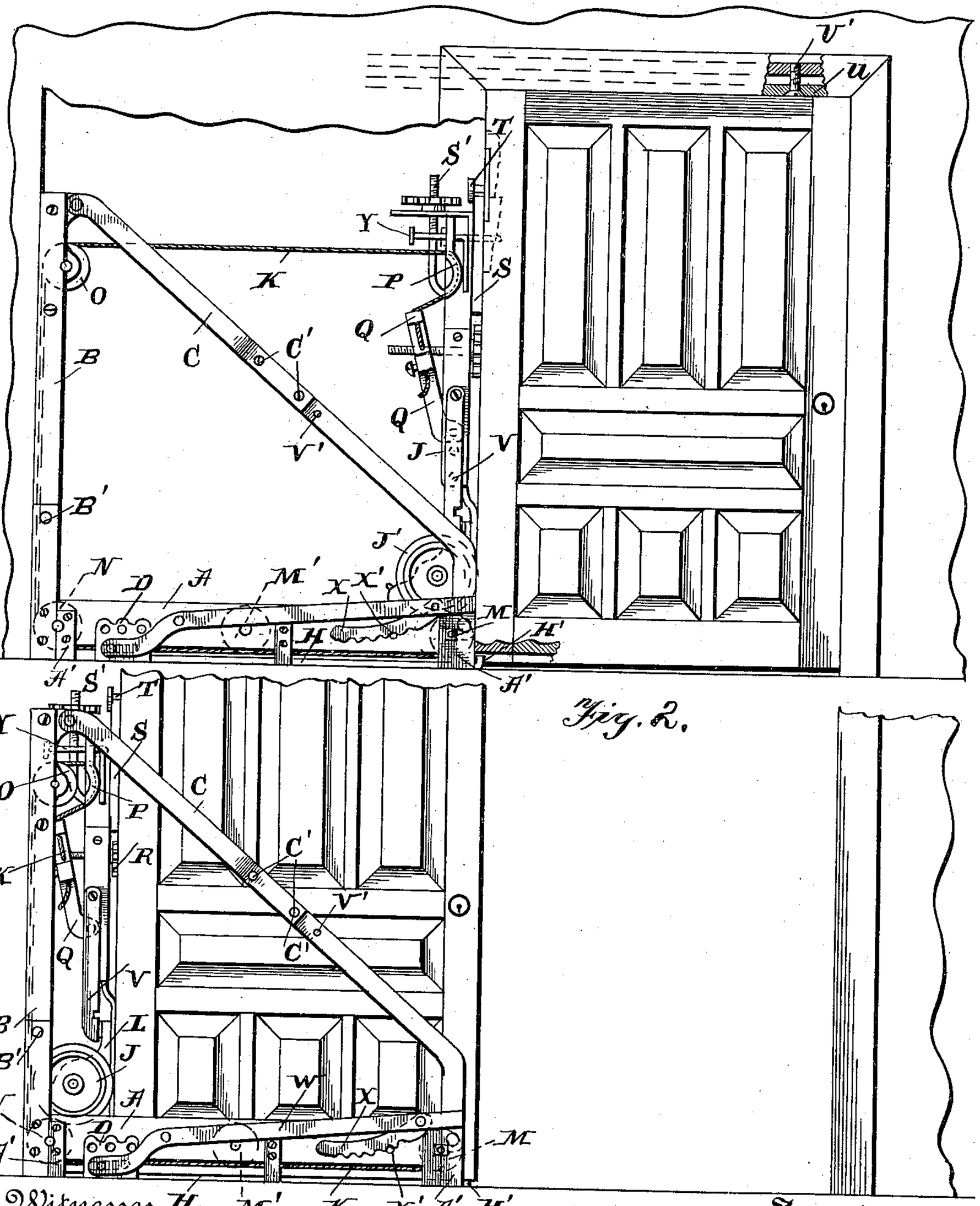

Fig. 2.

Witnesses
Geo. E. Frech.
B. E. Seitz

Inventor
W. K. Rairigh
By J. M. Nesbit
Attorney

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Fig. 5.

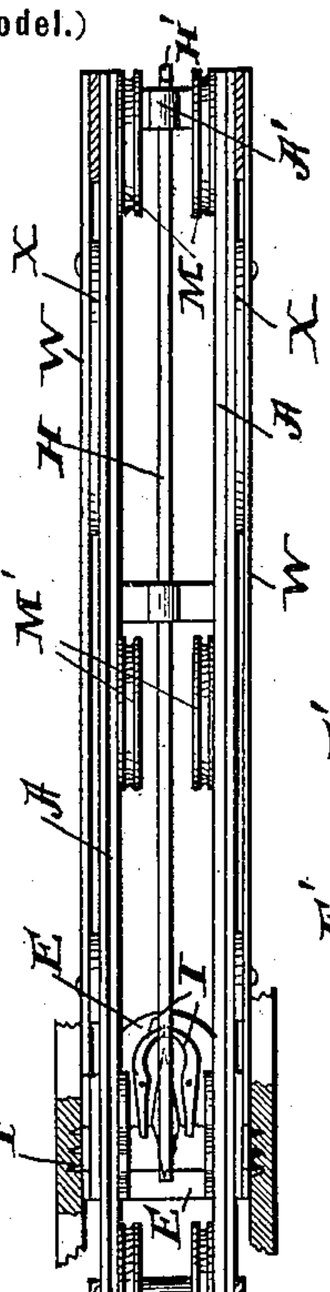


Fig. 6.

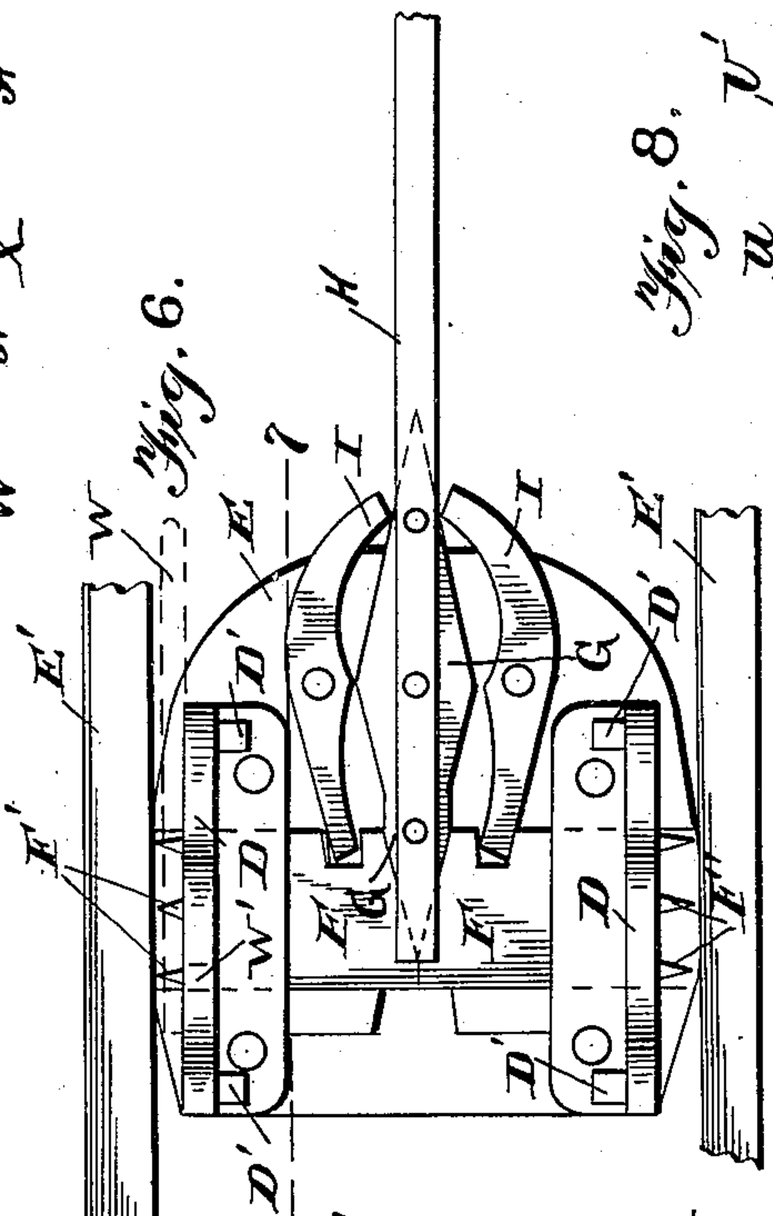


Fig. 8.

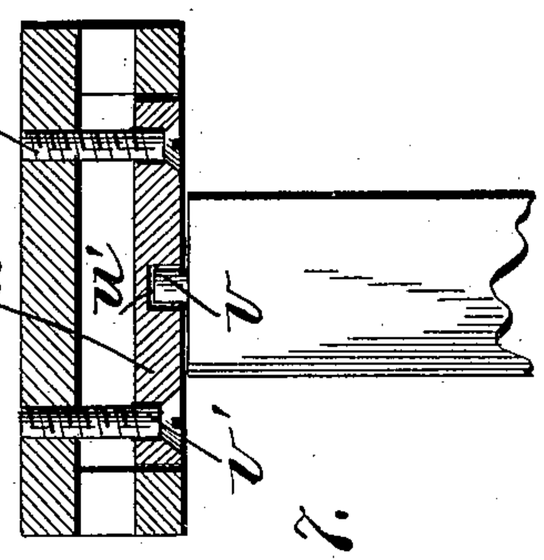


Fig. 7.

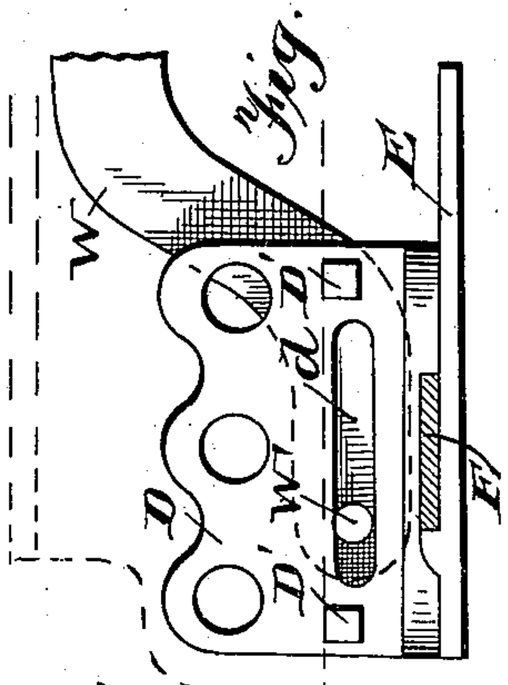
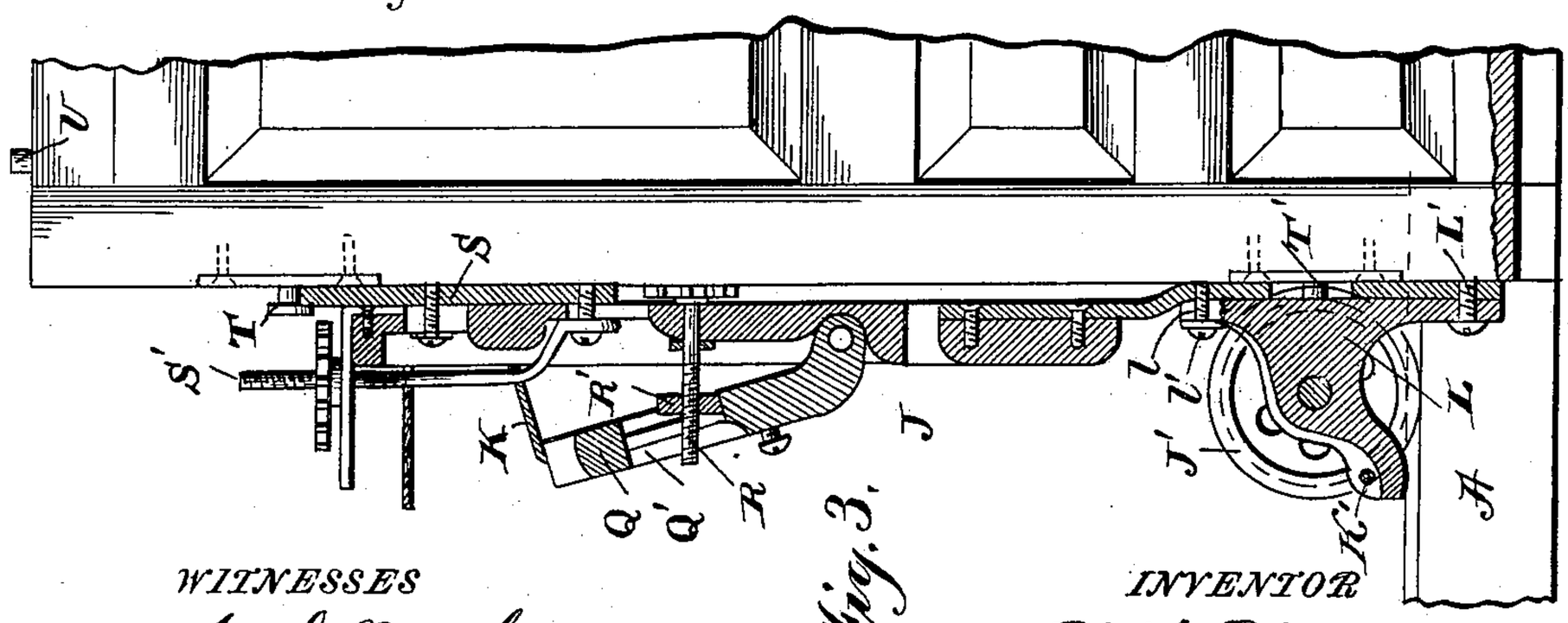


Fig. 4.

Fig. 3.



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B. E. Seitz

INVENTOR

W. K. Rairigh

By J. M. Heslet

Attorney.

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Fig. 9.

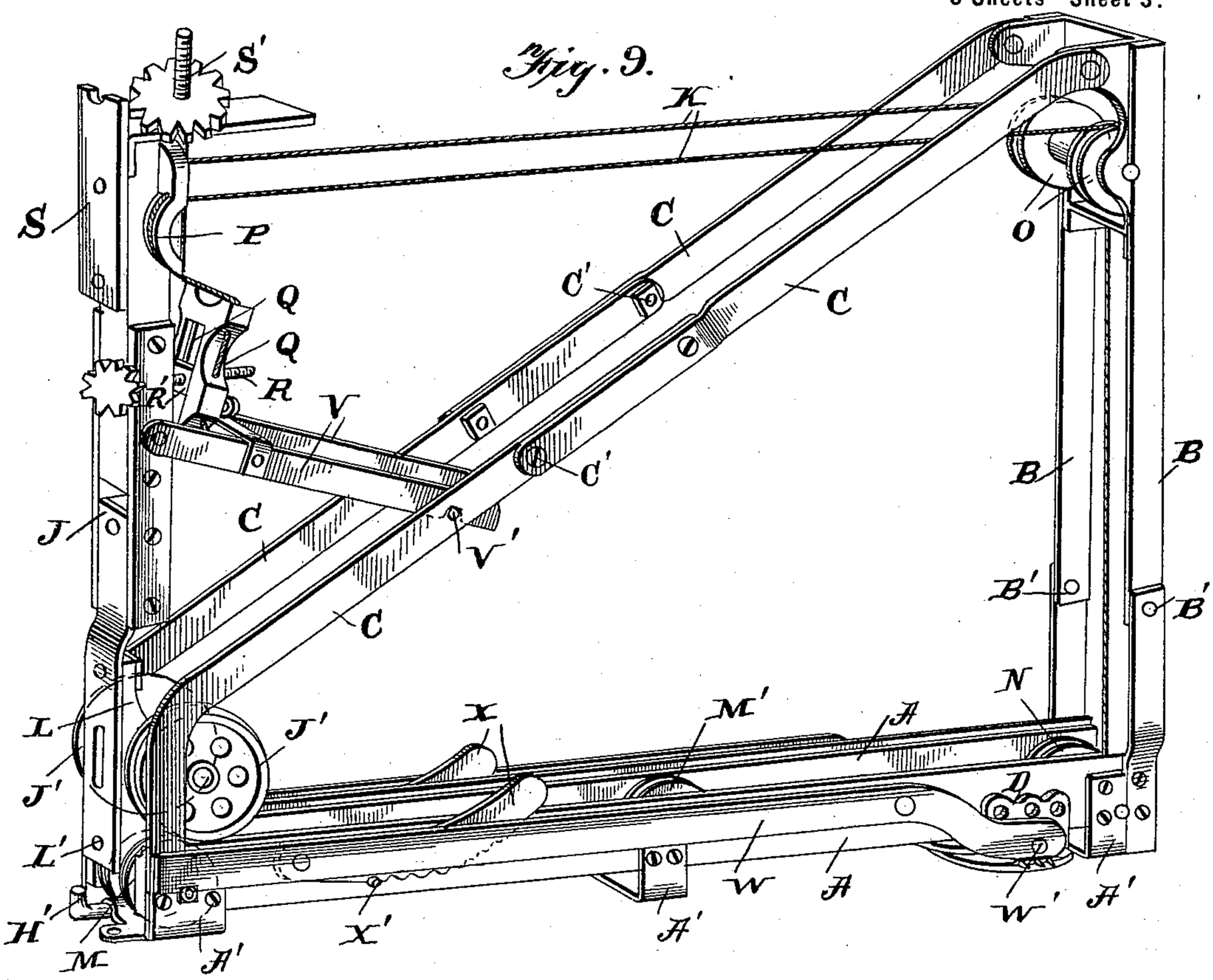
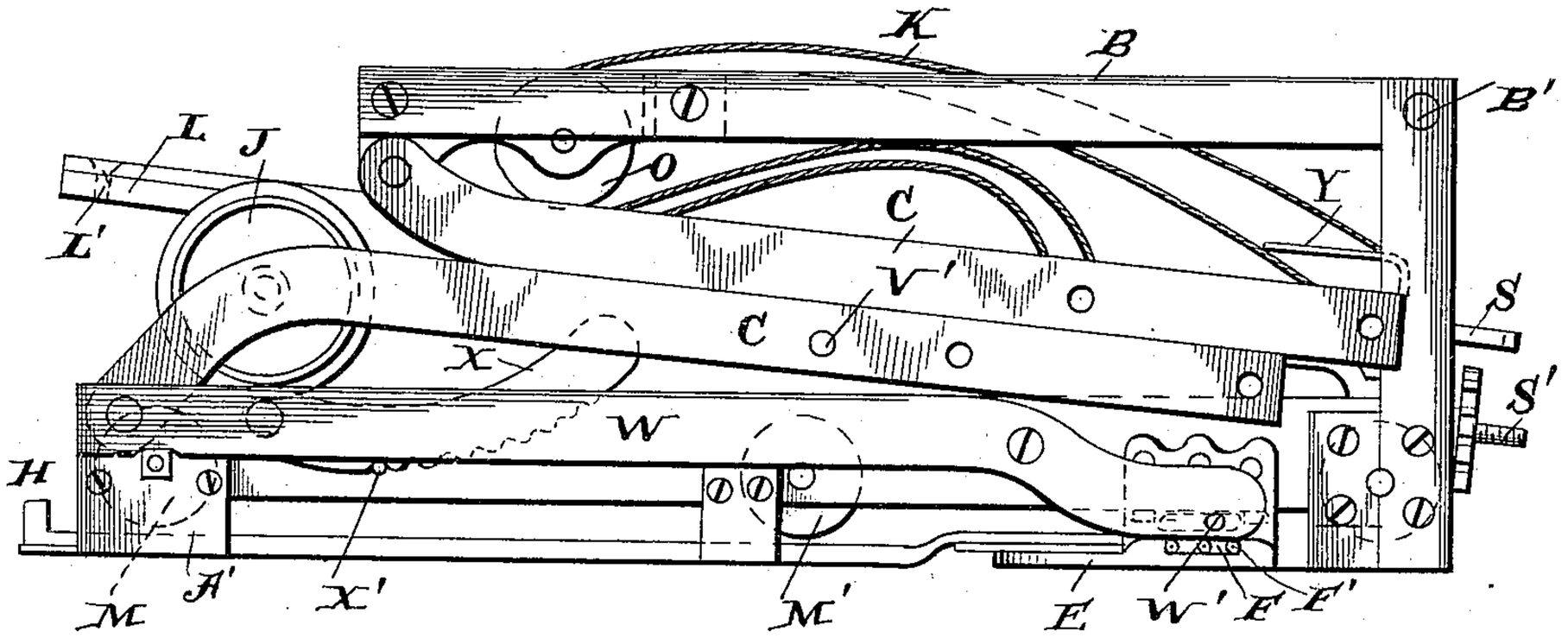


Fig. 10.



WITNESSES

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B. E. Seitz

INVENTOR

W. K. Rairigh.
By J. M. Nesbit
Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM K. RAIRIGH, OF KITTANNING, PENNSYLVANIA.

SLIDING DOOR.

SPECIFICATION forming part of Letters Patent No. 618,617, dated January 31, 1899.

Application filed March 18, 1898. Serial No. 674,378. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM K. RAIRIGH, a citizen of the United States, residing at Kittanning, in the county of Armstrong and State of Pennsylvania, have invented new and useful Improvements in Sliding Doors, of which the following is a specification.

This invention pertains to a sliding-door balance; and its primary object is to provide a combined hanger, track, and balance mechanism adapted to be removably positioned in the wall-pocket and sustain the entire weight of the door and maintain the latter in proper adjustment. The usual overhead hangers and track are dispensed with, the only operating part above the door being a vertically-adjustable guiding-cleat. The door may not only be conveniently dismounted whenever necessary, but the whole hanger mechanism may be as readily removed from the pocket as it is inserted and is capable of such several adjustments as effectually compensate for any unevenness or settling of the walls or door.

The invention consists in the novel features of construction hereinafter fully described and claimed, and illustrated by the accompanying drawings, in which—

Figure 1 is a side elevation of my improved mechanism positioned in a wall-pocket, the door being closed. Fig. 2 is a similar view, the upper portion of the door being broken away and shown pushed back into the pocket in open position. Fig. 3 is a vertical sectional view of the carrier. Fig. 4 is an inner face view of the same. Fig. 5 is a plan view of the track mechanism. Fig. 6 is an enlarged detail view of the clutch mechanism for securing the rear end of the track-frame in the pocket. Fig. 7 is a sectional view on line 7 7 of Fig. 6. Fig. 8 is a cross-sectional view of the top of the door-frame. Fig. 9 is a detail perspective view of my improved apparatus. Fig. 10 is an elevation showing the same folded in a compact form.

A designates two track-bars rigidly united by strips A′, and extending from the rear ends of the tracks are uprights B, and the upper ends of these uprights are secured to the front ends of the track-bars by brace-arms C, thus completing a rigid structure of which the tracks are the base. The frame thus formed is narrow and elongated vertically and adapted to be removably positioned in the wall-pocket, and is secured therein at its forward end by screws passing through eyes in the forward strip A′ into the floor. The rear ends of the track-bars rest upon lugs D′ on the inner side of brackets D, raised from base-piece E. This piece E rests upon the pocket-floor between timbers E′ and is fixed in said position by the sliding clutch members F, toothed at their outer ends, as indicated at F′, to engage the said timbers, the inner ends of the slides being beveled to admit one end of the double wedge G. This wedge is secured to the under side of rod H, which projects to the front end of the track-bars and there formed into a hold, as indicated at H′. The forward end of the wedge works between the adjacent ends of levers I, the opposite ends of said levers loosely engaging notches in clutch-slides F. Thus it will be seen that a backward movement of rod H will force outward said clutch-slide and automatically move toward each other the forward ends of levers I, while a reverse movement of rod H projects the forward end of double wedge G between said levers, separating the same and drawing inward the clutch-slide, so as to disengage the same from timbers E′. Thus it will be seen that all the means for securing the mechanism in the wall-pocket are accessible at the front or exposed end of the track and may be quickly and conveniently manipulated.

Vertically-elongated carriage J has rollers J′ at its lower end, which afford it a frictionless mounting upon the track, and this carriage is maintained in proper position by a suitable arrangement of balance-wires and the weight of the door which it sustains, as will be now explained. The balance-wires K are two in number and parallel each other, the same being secured at K′ to base portion L of the carriage, in which rollers J′ are journaled. From thence said wires pass forward and downward around sheaves M, journaled between the forward ends of track-bars A, then backward over guiding-idlers M′, and beneath and upward around sheaves N, journaled at the junction of bars A and uprights B. From thence the wires pass upward over sheaves O near the upper ends of uprights B, then horizontally forward to the carriage,

where they pass inward around the curved guides P to the upper free end of the vertically-swinging head Q, to which the ends of the wires are secured. This head is pivoted to the carriage, as shown, and slotted vertically at Q′, and when tightening wires K the head is swung outward from the carriage by screw R, having its head exposed at the face of the carriage and engaging nut R′, which oscillates in slot Q′.

For mounting the door upon the carriage the latter is provided at its upper end with bar S, adjustable vertically on the front face of the carriage by screw S′, and this bar is notched at its upper extremity to receive the headed stud T, projecting from the rear edge of the door. The lower end of the door is held in place upon the carriage by stud T′, which enters a vertically-elongated slot in the lower portion of the carriage, as shown. The door thus mounted is rigidly united with the carriage and not only maintains the latter in upright position, but also serves to hold the carriage and the balance-wires in proper relative position, and the door may be elevated or lowered, as may be necessary, by screw S′. By manipulating screw R so as to give head Q greater outward inclination wires K are proportionately shortened, with the effect that the upper end of the carriage is tilted backward and the door given a corresponding position. The opposite effect is secured by running screw R backward and permitting head Q to turn inward toward the carriage, and thus it will be seen that the carriage may be adjusted and plumbed so as to sustain the door in proper adjustment regardless of any shrinking or settling of the door-frame. The part L of the carriage is pivoted at its lower end, as indicated at L′, and at its upper end formed with wide slot *l* where it embraces screw *l′*, and by this means the carriage-rollers are permitted to oscillate with respect to the carriage, and thus compensate for any unevenness or inequality in the tracks without affecting the upright position of the carriage, which otherwise would be impaired by such defects in the track.

Pins U project from the top edge of the door into slot *u′* of cleat *u*, and the latter has free vertical movement on screws U′, which enter the door-frame. The guide for the top of the door may thus respond to any adjustment given the door and may be raised by turning upward the supporting-screw should it be desired to elevate the door, thus preventing the cleat from rubbing on its top edge. The door may be readily dismounted from the carriage by raising it sufficiently to disengage headed stud T from bar S. To prevent the carriage from falling backward upon the track when the door is removed and also to render it rigid with the track-frame when positioning the balance, I provide the swinging braces V, adapted to engage stops V′ on arms C, as shown in Fig. 9. After the door has been hung these braces are turned down and out of the way, as indicated in Figs. 1, 2, and 4.

Should the pocket-floor settle or from any other cause depart from its proper level, I provide means for leveling the track-bars, so that the apparatus may be maintained at all times in proper adjustment, and this means consists of the elongated levers W, fulcrumed near their rear ends to track-bars A, with their front ends extending to the corresponding extremities of said bars. The rear ends of these levers are curved downward slightly and carry studs W′, which move in horizontal slots *d* of brackets D, and by elevating the forward end of levers W the rear portions of the track structure may be raised. The levers are held in the desired adjustment by the notched dogs X, pivoted thereto, which engage pins X′, projecting from bars A. Should it become necessary to elevate the forward end of the track structure, a strip or block of proper thickness may be inserted beneath the forward strip A′.

For storing and shipping the door-balance the same is folded into compact form, as illustrated in Fig. 10, this folding being accomplished by means of joints B′ in uprights B and the removal of bolts C′, which secure together the two-part arms C. It is thus put in convenient form for packing and at the same time the more delicate portions of the carriage are protected from breakage.

With the apparatus in position in the wall-pocket it may not be convenient to unite brace V with arms C, and in order to prevent the carriage from falling backward when the door is removed I provide the hook Y, adapted to be extended outward from the upper portion of the carriage and turned when thus extended to confine a wedge between it and the door-casing, as indicated in dotted lines in Fig. 1, thus holding the carriage in upright position after the door has been removed.

A complete hanger and balance is thus provided which may be placed in position in any wall-pocket and the door readily mounted thereon and maintained in absolutely accurate adjustment.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An improved hanger for sliding doors consisting of a track adjacent the lower end of the door, a door-sustaining carriage movable thereon, and means for varying the position of the carriage so as to conform the door to its frame, substantially as shown and described.

2. The combination of a track, an upright carriage adapted to engage the rear edge of a sliding door and sustain the entire weight of the door at said edge, and mechanism for varying the position of the carriage with respect to the track, substantially as shown and described.

3. An improved door-hanger including a

track, a carriage movable upon this track, and vertically-adjustable door-sustaining means carried by the carriage, substantially as shown and described.

4. An improved door-hanger including a track, a door-sustaining carriage, and a truck mechanism adapted to oscillate with relation to the carriage for maintaining the latter in proper position without regard to inequalities of the track, substantially as shown and described.

5. An improved door-hanger including a track, a door-sustaining carriage, sheaves, and balance-wires secured at their extremities to upper and lower portions of the carriage and adapted to pass over these sheaves and maintain the carriage in proper position, substantially as shown and described.

6. An improved door-hanger including a track, a carriage movable thereon, sheaves, balance-wires secured at their extremities to upper and lower portions of the carriage, and means for varying the length of the wires, substantially as shown and described.

7. An improved door-hanger including a track, a door-sustaining carriage movable thereon, sheaves, and balance-wires secured at one extremity to the lower portion of the carriage, and passing around the sheave and at their opposite extremities secured to an outwardly-swinging block mounted on the carriage, and mechanism for adjusting the block, substantially as shown and described.

8. An improved door-hanger including a track-frame adapted to fit within a wall-pocket, sheaves rotatably mounted at its forward and rearward ends, sheaves journaled above the rear ends of the track, an upright carriage adapted to move at its lower end upon the tracks, the carriage being adapted to sustain a door, and balance-wires secured at one extremity to the lower portion of the carriage, thence passing forward around and beneath the sheaves at the forward end of the tracks, thence rearward beneath and around the sheaves at the rear ends of the tracks, thence upward around and over the elevated sheaves, and from thence forward to the upper portion of the carriage to which they are secured, substantially as shown and described.

9. An improved door-hanger including the united track-bars, the uprights extending from the rear ends of the track-bars, the inclined brace-arms rigidly uniting the upper ends of the uprights and the forward ends of the track-bars, thus constituting a rigid frame, and a door-sustaining carriage movable upon the track, substantially as shown and described.

10. An improved movable door-hanger including track-bars, the jointed uprights, jointed braces pivoted to the uprights and the forward ends of the track-bars, and a door-sustaining carriage movable upon the track-bars, substantially as shown and described.

11. The combination with the track-bars adapted to extend into the wall-pocket, a support for the rear end of the bars, and elongated levers fulcrumed between their ends to the bars, the forward ends of the levers extending outward toward the front ends of the tracks, and the rear ends of the levers adapted to engage the track-supports, whereby when the forward ends of the levers are elevated the tracks will be elevated, substantially as shown and described.

12. The combination with the track-bars, the levers fulcrumed between their ends and adapted at their rear ends to engage the supports for the track-bars, the forward ends of the levers extending toward the forward ends of the tracks, and the dogs pivotally secured to the forward ends of the levers and adapted to sustain the latter in proper adjustment, substantially as shown and described.

13. In a hanger, the combination of the track-bars, and laterally-extensible clutch devices adapted to secure the bars in position, substantially as shown and described.

14. The combination of the track-bars of a door-hanger adapted to be positioned between the side timbers of a wall-pocket, laterally-extensible clutch devices adapted to engage the timbers and secure the tracks in position, and mechanism for extending and retracting the clutch devices, substantially as shown and described.

15. The combination of the track-bars of a door-hanger, laterally-extensible clutch devices for securing the tracks in position in the wall-pocket, a longitudinally-movable rod, a wedge carried by the rod for entering between the extensible clutch devices for projecting them laterally, and mechanism carried by the rod for retracting the clutch devices when moved in the opposite direction, substantially as shown and described.

16. The combination of a door-hanger track, laterally-extensible clutch devices for securing the tracks between the timbers of a wall-pocket, a longitudinally-movable rod, a double-ended wedge adapted at one end to enter between the clutch devices and extend the same, levers fulcrumed between their ends and at one end secured to the clutch devices, the opposite end of the wedge adapted to enter between the free ends of the levers for retracting the clutch devices, substantially as shown and described.

17. The combination of the track-bars, the horizontally-slotted brackets, supports for the track-bars on the brackets above the slots therein, and track-elevating levers carrying studs which extend into the slots of the brackets, substantially as shown and described.

18. A guide for the upper end of a sliding door, consisting of a cleat having free vertical play, the cleat being grooved in the direction of its length to embrace a vertical portion of the door for holding the same from lateral displacement, substantially as shown and described.

19. An improved guide for the top edge of a sliding door, including a longitudinally-grooved cleat, the door being provided with pins which move in the said groove, and depending screws upon which the cleat is movable vertically, the screws being capable of adjustment in varying the position of the cleat, substantially as shown and described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM K. RAIRIGH.

Witnesses:
R. P. MARSHALL,
T. N. MCKEE.