(No Model.)

J. KAISER.

DOOR OR SHUTTER STRAIGHTENER.

No. 430,032. Patented June 10, 1890.

Fig. I.

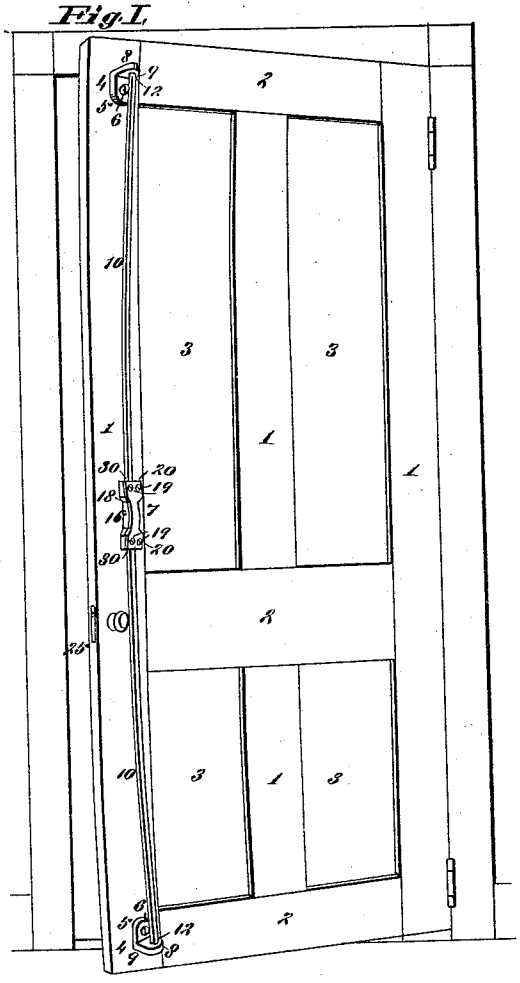


Fig. II.

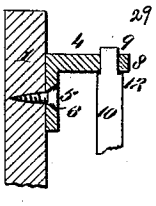


Fig. III

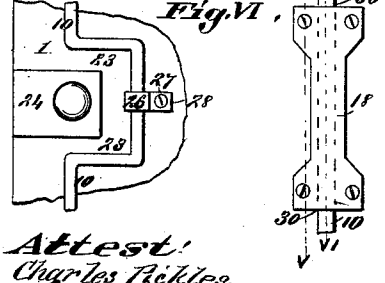


Fig. IV.

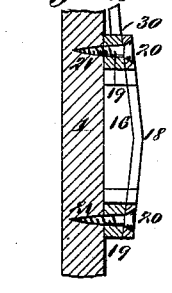


Fig. V

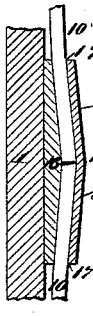


Fig. VI.

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JACOB KAISER, OF ST. LOUIS, MISSOURI.

DOOR OR SHUTTER STRAIGHTENER.

SPECIFICATION forming part of Letters Patent No. 430,032, dated June 10, 1890.

Application filed January 27, 1890. Serial No. 338,252. (No model.)

To all whom it may concern:

Be it known that I, JACOB KAISER, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Door or Shutter Straighteners, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to devices for straightening doors, shutters, and other like frames that have become warped in seasoning; and the invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Figure I is an elevation of a door the view side of which has a concave warp, and shows the push member of my straightening device secured thereto to reduce the warp. Fig. II is an enlarged detail longitudinal section, and shows one of the terminal attachments of the push member of the device shown in Fig. I. Fig. III is an enlarged detail front view of the central coupling and attachment clamping-block. Fig. IV is a vertical section taken on line V V, Fig. IV, and shows the means of attachment of the clamping-block. Fig. V is a vertical section taken on line VI VI, Fig. IV, and shows the clamping-rods in their coupling-seats in the block. Fig. VI is an enlarged detail view of the door adjacent to the lock attachment when said lock projects from the face of the door and shows the clamping-rod bent to an angle around the lock.

Referring to the drawings, 1 represents the stiles, 2 the cross-bars, and 3 the panels, of the doors.

4 represents the buffer-clamping or tension angle-plates, which are secured by the screws 5, seated in their perforate screw-seats 6, to one of the stiles or cross-bars of the door-frame, as the case may be, respective to its application either to straighten in the one case a longitudinal or in the other case a transverse warp, if short clamp bars or rods are used. These buffer-clamping angle-plates are preferably placed in the position shown in Fig. I, when the push member 7 of the straightening device is used (as shown in that figure) attached to the concave side of the warped door. Thus, as shown in Fig. I, the projecting angle-lugs 8 of the clamping-plates, whose perforate centers 9 seat round ends of the preferably square clamping-bars 10, are placed outside or beyond their angle attachment lugs. The outer ends of the square clamping-bars 10 are preferably rounded, so as to provide at the commencement of the square form of each of said bars a shoulder 12, that fits and when clamping respectively pushes against each of the projecting angle-lugs 8.

16 represents a coupling-box block, in the central longitudinal double-bevel channel-groove 17 of which the coupling ends of the clamping-bars 10 are seated and tightly held by the cap-plate 18 through perforations 19, in the corners of which and in the boxing-block screws 20 are seated, the points of which screws are screw-seated at 21 in the stile of the door.

23 represents a rectangular turn in the lower clamping-bar 10 around the lock when rim-locks 24 in contradistinction to mortise-locks 25 are attached on instead of mortised in the doors, and 26 is a tube-bracket, in which said inset portion of the clamping-bar is seated and slides. The said tub- ck et is secured to the stile of the door by a screw 27, that passes through the perforate foot-lug 28 of said tube-bracket, and is screw-seated in the stile of the door.

I have shown and described my invention as applied for reducing the longitudinal warp of a door; but it is evident that the device would be equally applicable for reducing a transverse warp of the doors or for reducing either longitudinal or transverse warps of shutters, &c., and it can be thus used in a horizontal instead of a vertical position, as above described. After the door or shutter has been straightened and held in its rectified position for a sufficient period to fully set the same the straightening devices may then be removed.

The operation of the device is as follows: The buffer-clamping or tension angle-plates 4 are secured to the stiles of the doors by screws, shown in Fig. I, when the push or clamping member is used on the concave side of the warped door.

I will now describe the other elements of the push or clamping member. The round terminals 29, respectively at the upper and lower

ends of the two coadjutant clamping-bars 10, are seated, respectively, in the perforate centers 9 of the projecting lugs of their buffer-clamping angle-plates, and the adjacent shoulders 12 of said clamping-bars press against said lugs. The inner ends 30 of each of the two coadjutant clamping-bars are seated in contact with each other in their respective inclined channel-grooves 17 in the coupling-box block 16, the inclines of which provide an elongated bow position to the combined arrangement of the push or clamping member of the device. The cap-plate 18 is then placed in position on the coupling-box over the inner ends 30 of the clamping-bars, and the screws 20 are passed through perforations 19 in said plate and box, and are screwed into the stile of the door, thus adjustably drawing the coupling-box sufficiently close to the stile to straighten or sufficiently near straighten the position of the previously-bowed coadjutant clamping-bars, so that the shoulders of said bars, pushing against the projecting lugs of their respective buffer-clamping plates 4, force back the projecting ends of the concave warped stile, while the coupling-box retains its hold of the center, and the door-frame is thus straightened. The normal inoperative position of the coupling-box block 16 before the straightening process commences is sufficiently projected from the surface of the stile to provide abundant latitude for the adjustable driving of the draw-screws to regulate the degree of the straightening process required for the reduction, respectively, of any varied degree of warp. Thus if the door or other frame is but slightly warped said coupling-box block, that carries the conjunctive inner ends of the clamping-rods 10, will require to be drawn by the screws 20 but a comparatively short distance toward the stile; but when the frame is more largely warped the adjustable block will then require to be drawn closer to the stile, so as to have a more stringent effect in reducing the more extreme warp. If the other edge of the door is also warped with a concave presentation, a duplicate clamping device is also attached to the stile on that side. If, on the other hand, there is a concave transverse warp of the frame, the clamping device is of substantially the same construction, except that the clamping-bars are made shorter to correspond with the width instead of with the length of the door. When a rim-lock (instead of a mortise-lock) is used and projects from the stile on the side to which the device is attached, the adjacent clamping-bar, as previously described, has provided a rectangular turn 23, to avoid the interference of the lock, and is seated and slides in the tube-bracket 26 as the clamping and straightening process is accomplished.

The device is alike adapted for straightening shutters and other like frames as well as doors.

When the frames have been straightened and are set in straight position, the straightening apparatus can then be removed.

I have shown the device nearly the extreme length of the door-frame; but I do not confine myself to such proportionate length, as it may be made of any required length to suit the condition of either the longitudinal or transverse warp, sometimes not being required to extend half-way, respectively, of either the length or the breadth of said door or frame.

I claim as my invention—

1. In a door or shutter straightener, the combination of the angle-plates 4, the clamping-bars 10, whose outer terminals engage in the perforate centers of the projecting lugs of said angle-plates, and the coupling-box block 16, that connects said clamping-bars, substantially as and for the purpose set forth.

2. In a door or shutter straightener, the combination of the angle-plates 4, provided with the projecting perforate lugs 8, the clamping-bars 10, whose outer ends engage in said perforate lugs, the coupling-box block provided with double-bevel inclined channel-grooves, in which the inner ends of said clamping-bars are seated, the cap-plate 18, and the screws 20, that secure said cap-plate to the block and adjustably secure said block to the stile of the frame arranged to straighten the same, substantially as and for the purpose set forth.

3. In a door or shutter straightener, the combination of the angle-plates 4, the clamping-bars 10, the coupling-box block that connects said clamping-bars, one of said coupling-bars being provided with a rectangular divergent turn 23, to avoid the door-lock, and the tube-bracket 26, secured to the frame, in which tube said divergent portion of the clamping-bar slides, substantially as described, and for the purpose set forth.

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In presence of—
BENJN. A. KNIGHT,
SAML. KNIGHT.