(No Model.)

C. F. NICKERSON & L. M. FLEET.

SHUTTER WORKER.

No. 484,972. Patented Oct. 25, 1892.

Fig. 1.

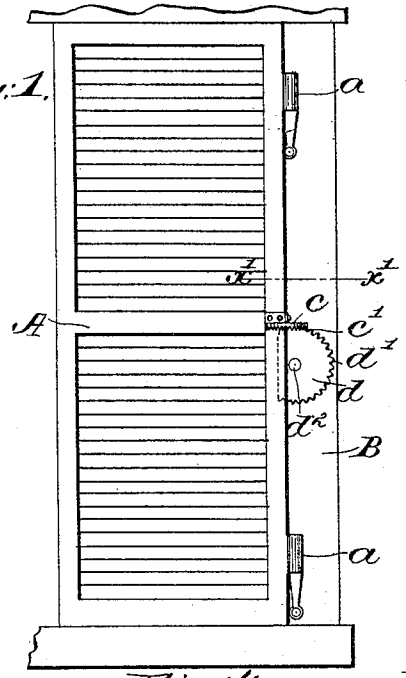


Fig. 2.

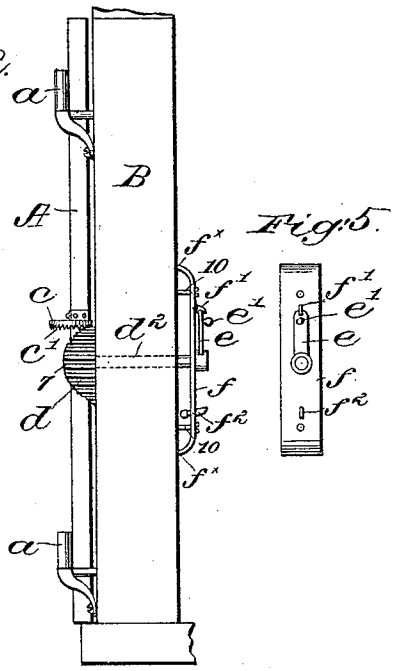


Fig. 5.

Fig. 4.

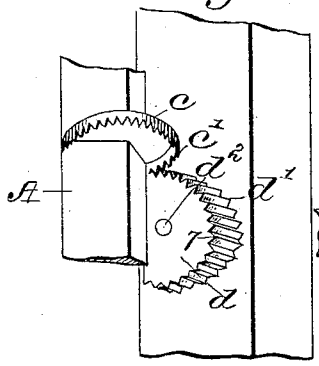


Fig. 3.

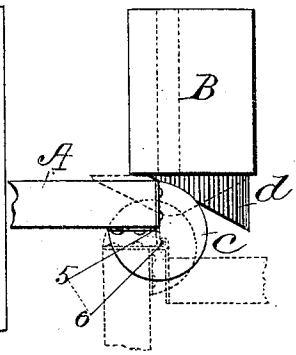


Fig. 7.

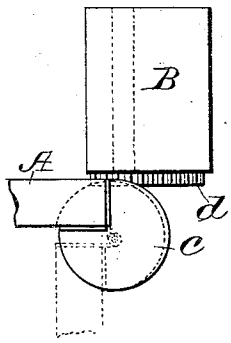
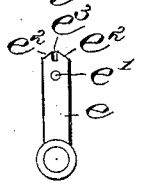


Fig. 6.



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UNITED STATES PATENT OFFICE.

CHARLES F. NICKERSON, OF READING, AND LINDLEY M. FLEET, OF BOSTON, MASSACHUSETTS.

SHUTTER-WORKER.

SPECIFICATION forming part of Letters Patent No. 484,972, dated October 25, 1892.

Application filed September 1, 1891. Serial No. 404,396. (No model.)

To all whom it may concern:

Be it known that we, CHARLES F. NICKERSON, of Reading, county of Middlesex, and LINDLEY M. FLEET, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Blind or Shutter Operating Devices, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to provide an improved device for operating outside blinds or shutters from the interior of a building.

In accordance with this invention the blind or shutter is fitted with a curved rack, which is in mesh with and operated by a toothed sector or wheel, the shaft of which is extended through the wall of the building to the interior, where it is fitted with suitable operating and retaining devices.

One part of this invention therefore consists in the combination, with a blind or shutter hinged to a wall and a curved rack attached to the inner edge of said blind, of a toothed sector mounted on a shaft journaled in said wall, the pitch-line of the teeth of said sector and rack extending farther from said wall at one point than another, substantially as will be described.

Other features of this invention will be pointed out in the claims at the end of the specification.

Figure 1 represents in front elevation a blind or shutter fitted with my improved operating device; Fig. 2, a right-hand end view of Fig. 1; Fig. 3, a cross-section taken on the dotted line x' x', Fig. 1; Figs. 4 and 5, details showing the rack and sector and the supporting-plate. Fig. 6 shows the operating-lever detached; Fig. 7, a modification to be described.

Referring to the drawings, A represents any usual blind or shutter mounted upon suitable hinges *a*, fixed to the wall or finish of the house or building B. The blind or shutter A at some convenient point has secured to its rear or inner edge a curved rack *c*, the teeth c' of which, as herein shown, are directed downwardly to mesh with the peripheral teeth d' on the sector *d*, fixed to the outer end of the shaft d^2, journaled in suitable bearings in the wall of the building B, and having its inner end inside the wall preferably made square or other than round to receive the handle-lever *e*, provided with an operating-handle e' and having its outer end beveled at e^2 on either side of the central recess e^3. (See Fig. 6.) The supporting-frame *f*, which is secured to the interior wall of the building to serve as a support for the inner end of the shaft d^2, has pivoted to it the two pawls f' f^2, so arranged that one or the other of them will drop into the recess e^3 whenever the lever *e* is moved into a vertical position to hold the said lever and the blind or shutter in position. The blind is represented in Fig. 1 as closed, it being held closed by the latch f' dropped into the recess e^3 in the lever *e*. By lifting the latch and grasping the handle e' the shaft d^2 and its sector *d* may be rotated to the right, Fig. 1, and will act through the rack *c* to swing the blind into its open position back against the building, one of the inclined faces e^2 on the lever *e* depressing the pawl f^2 as it approaches and permitting the pawl to spring into the recess e^3 and hold the lever and blind in its open position. The blind may be again closed from the inside by depressing the pawl f^2 and rotating the shaft d^2 back to its former position. The pivotal point of the hinge of a blind or shutter, being as a rule offset from the blind itself, (see Fig. 3,) causes the inner or rear edge of the blind to describe a circle bodily about the pivotal center of the hinge, the radius of the circle being the distance (five to six) from the pivotal center of the hinge to the blind, so that as the blind is swung from its closed position, Fig. 1, to its open position against the wall of the building the rack *c*, if bent on a true curve, would swing away from and out of engagement with the sector. To obviate this the sector is thickened at 7 intermediate its ends, a portion of its teeth at this point extending to a greater distance from the building than others, so that the longer teeth of the sector will come into play as the blind swings away from the building in turning, thus keeping the teeth of the sector and rack always in mesh. In other words, the pitch-line of the teeth of the rack and sector is inclined with relation to the sector-shaft or to the wall of the building. The

ends of the sector are made thin to permit the blind to swing up close to the building, as shown in Fig. 3, when either fully open or closed without necessitating the cutting away of the material of the blind to make room for the sector.

As herein shown, the rack *c* is made elliptic in form, so that it will extend farther away from the blind when the same is in an intermediate position farthest from the wall of the building and from the sector to also assist in keeping the two in mesh with each other.

While we have herein shown the rack as elliptic in form and the sector as formed so that some of the teeth extend farther from the wall than others, it is evident that the elliptic rack may be employed with a plain sector, as shown in Fig. 7, or the sector of varying thickness may be employed with a rack curved on a true circle. In lieu of the sector placed square with the shaft d^2 and made thicker in some portions than others a toothed sector of uniform thickness, but placed on the shaft at an angle, may be employed, the teeth in such a construction being carried farther from the wall at some points than at others, owing to the angularity, or substantially in the pitch-line, and we desire it to be understood that while we only have shown and described a sector or portion of a wheel *d*, still we consider a complete wheel as a full equivalent and as included in this invention.

The support *f* is preferably formed with legs $f^\times$ at its ends, so that the support may be easily applied to finish having an irregular surface, the legs being inserted into the material or cut off to fit the varying surface of the finish to which it is applied, the support being held in place by screws 10.

This invention is not limited to the particular construction herein shown.

We claim—

1. A wall, a blind hinged thereto, and a curved rack attached to the inner edge of said blind, combined with a toothed sector mounted on a shaft journaled in said wall, the pitch-line of the teeth of said sector and rack extending farther from said wall at one point than another, substantially as and for the purpose set forth.

2. The combination, with a shaft extended through the wall of a building and a blind operated thereby, of a support *f* for the inner end of said shaft, having legs $f^\times$, substantially as described.

3. The combination, with a shaft extended through the wall of a building and a blind operated thereby, of a support for the inner end of said shaft, the lever *e*, inclined faces e^2, recess e^3, and pawls f' and f^2, substantially as described.

4. A wall, a blind hinged thereto, and a curved rack attached to the inner edge of said blind, combined with a toothed sector mounted on a shaft journaled in said wall, the said sector at one side of its center being thinned and thereby made wedge-shaped to permit the blind to swing close against the wall without removing any of the material of the blind, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

CHARLES F. NICKERSON.
LINDLEY M. FLEET.

Witnesses:
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