

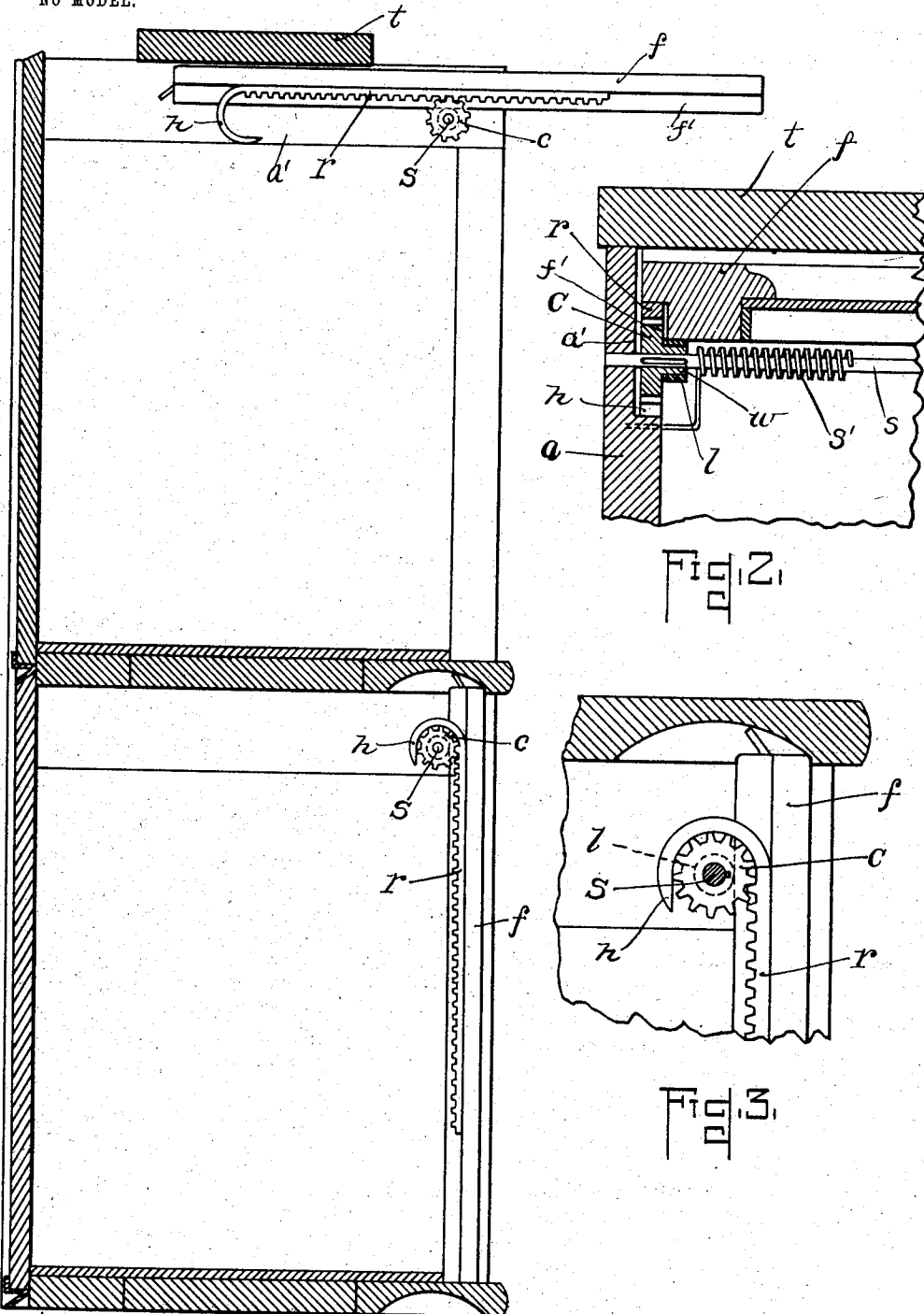
No. 761,312.

PATENTED MAY 31, 1904.

L. W. LUELLEN.
BOOKCASE.

APPLICATION FILED MAY 19, 1903.

NO MODEL.



Witnesses:
Austin M. Pinkham
Alfred L. Bennett

Fig. 1.

Inventor:
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UNITED STATES PATENT OFFICE.

LAWRENCE W. LUELLEN, OF BOSTON, MASSACHUSETTS.

BOOKCASE.

SPECIFICATION forming part of Letters Patent No. 761,312, dated May 31, 1904.

Application filed May 19, 1903. Serial No. 157,820. (No model.)

To all whom it may concern:

Be it known that I, LAWRENCE W. LUELLEN, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Bookcases, of which the following is a specification.

My invention relates to cases such as are often constructed in sections for the containing of books and the like, and more particularly to closures or doors therefor. It consists in certain features hereinafter described and more particularly claimed.

In the accompanying drawings, Figure 1 is a vertical transverse section through two sections of a case embodying one form of my invention. Fig. 2 is an enlarged longitudinal sectional detail with the door in its raised position; and Fig. 3 is a similar transverse section, but with the door closed.

Similar characters designate like parts throughout the several figures of the drawings.

The letter *a* indicates the end walls, and *t* the top bar, of a case, which is here shown as consisting of two similar sections, the open fronts of which are provided with closures or doors *f*. Preferably situated at the top of each side *a* is a horizontal recess *a'*, and extending between these recesses with its ends journaled in the walls near the front of the case is a longitudinal shaft *s*, at each end of which is fixed a pinion *c*, operating within the case-recess. Each end of the door may be provided along its edge with a recess *f''*, lying in substantially the same vertical plane as the recess *a'*, so that the pinions may lie in both the case and door recesses. Mounted within each door-recess is a rack *r*, meshing with the corresponding pinion *c* and having at its upper or inner end a preferably integral curved member or hook *h*, which in the closed position of the door engages the pinion upon its opposite sides, substantially conforming to the peripheral ends of the teeth, and in the open or raised position coöperates with the lower wall of the case-recess. Carried by the shaft, in the present instance as a portion of the pinions, are rolls *w*, adapted to contact with the inner side of the door and receive its weight while it is being opened, and thus relieve the pinions while they still remain in

coöperation with the racks. To reduce the noise, the rolls may be covered with leather, rubber, or other soft material *l*. To assist in the opening of the door, a spring *s'* preferably encircles the shaft and has its ends secured thereto and to the case, it being so arranged that the outward movement of the door puts it under a tension which is exerted to automatically move said door inward through the coaction of the pinions and racks after it has reached a horizontal position.

It will be seen that in the closed position of the door it will be supported and its upper end held at a definite point by the engagement of the hooks with the pinions. Then to open the door it is only necessary to swing it about the shaft as an axis until it is horizontal. The pinions being in mesh with the racks, the tension of the spring will tend to assist in this raising operation. Then when the horizontal position is reached the spring will draw the door inward at an equal rate at both ends, the hooks resting upon the lower wall of the case-grooves and serving as supports and guides. In closing the case the operation is reversed, the drawing out of the door now coiling up the spring and the coacting hooks and pinions stopping the door at the proper time in its downward movement. It is evident that this shaft fixed against movement of translation and the engaging hooks into which the racks merge provide a very positive stop and axis for the door in which sticking or displacement is impossible, and as an equalizing device by the engagement of the shaft-pinions with the door-racks it presents manifest advantages in obviating any binding of the door through lateral movement of the shaft. It may be also noted that the weight of the door is taken off the pinions and the mechanism rendered practically noiseless by the support of the rolls, which are always situated most effectively with relation to the other elements, and that the smoothness of movement is aided by the coöperation of the hooks and case, the former thus performing the triple function of support, stop, and guide. There is, further, a minimum of exposed mechanism within the case where it would be liable to catch contained articles.

Having thus described my invention, I claim—

1. The combination with a case and its door, of a longitudinal shaft journaled near the front of the case, a pinion fixed to the shaft near each end, racks mounted upon the door and coacting with the pinions, and rolls carried by the shaft and adapted to receive the weight of the door while it is being opened.
2. The combination with a case and its door, of a longitudinal shaft journaled near the front of the case, a pinion fixed to the shaft near each end, a spring encircling the shaft and secured thereto and to the case, racks mounted upon the door and coacting with the pinions, and rolls carried by the shaft and adapted to receive the weight of the door while it is being opened.
3. The combination with a case and its door each provided with recesses, of a longitudinal shaft journaled near the front of the case,

pinions fixed to the shaft and located within both the case and door recesses, racks mounted within the door-recesses and coacting with the pinions, and guide members carried by the racks and cooperating with a wall of the case-recess during the movement of the door.

4. The combination with a case and its door each provided with recesses, of a longitudinal shaft journaled near the front of the case, pinions fixed to the shaft and located within both the case and door recesses, racks mounted within the door-recesses and coacting with the pinions, and rolls carried by the shaft and cooperating with the inner side of the door.

In testimony whereof I have affixed my signature in presence of two witnesses.

LAWRENCE W. LUELLEN.

Witnesses:

MORTON J. SHAFFER,
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