3 Sheets—Sheet 1.

M. KER.

DEVICES FOR SUPPORTING SHELVES.

No. 182,201. Patented Sept. 12, 1876.

FIG 1

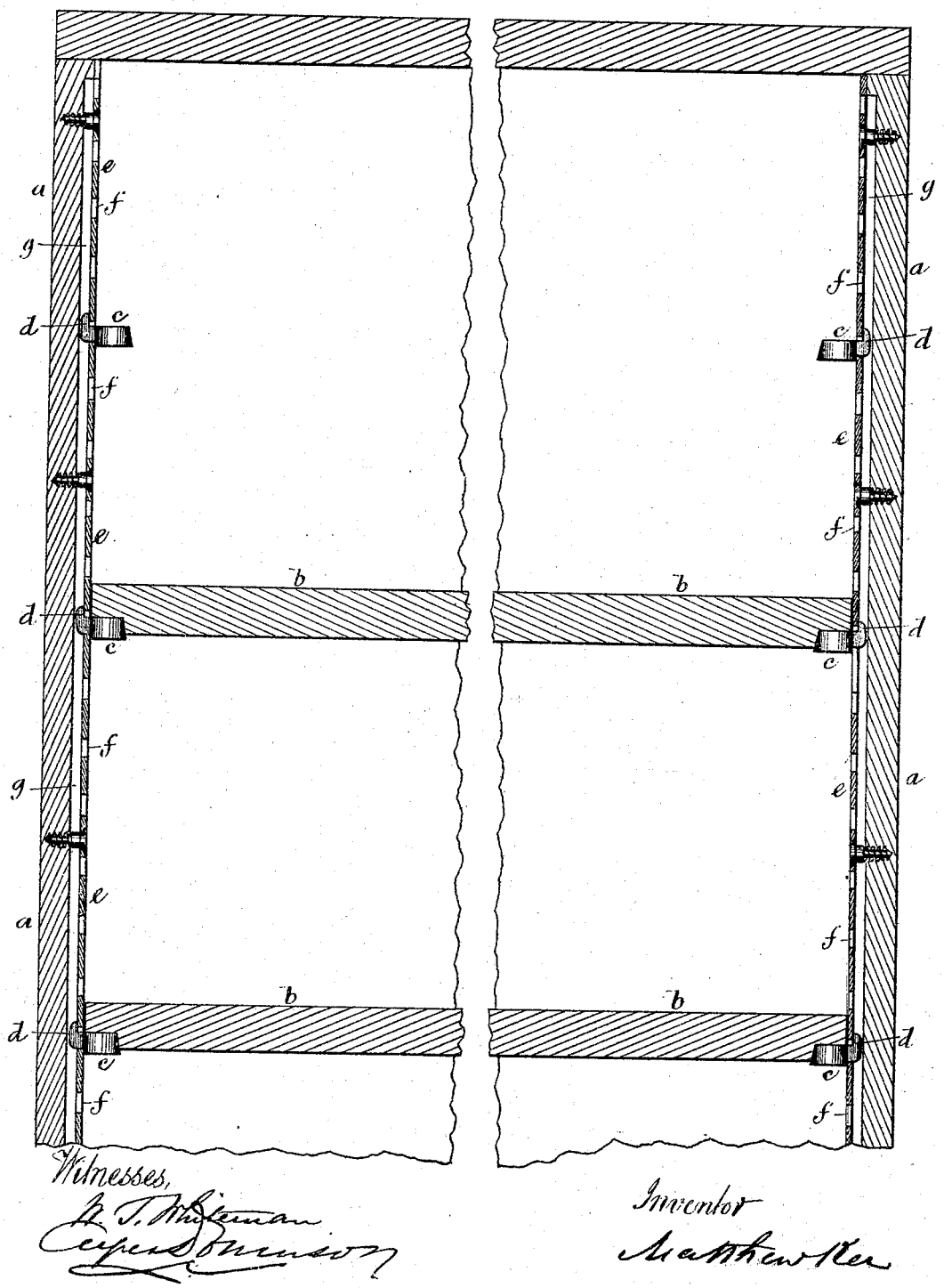

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Fig. 2.

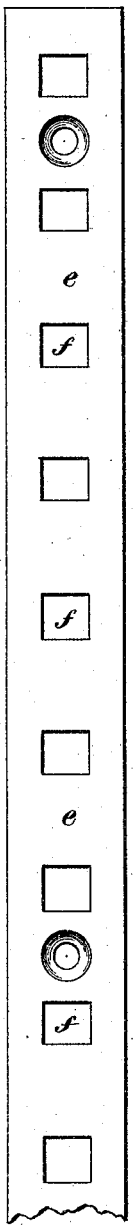
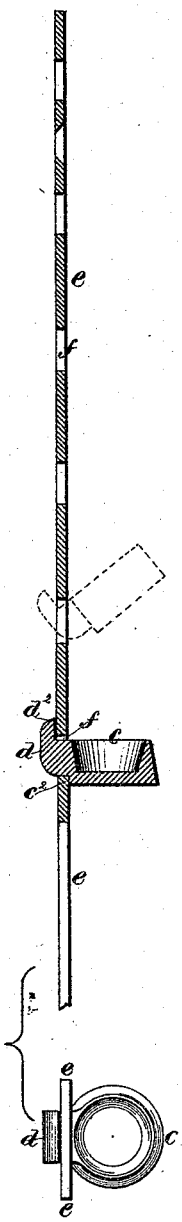


Fig. 3.



Witnesses.

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Inventor.

Matthew Ker

3 Sheets—Sheet 3.

M. KER.

DEVICES FOR SUPPORTING SHELVES.

No. 182,201. Patented Sept. 12, 1876.

Fig. 4.

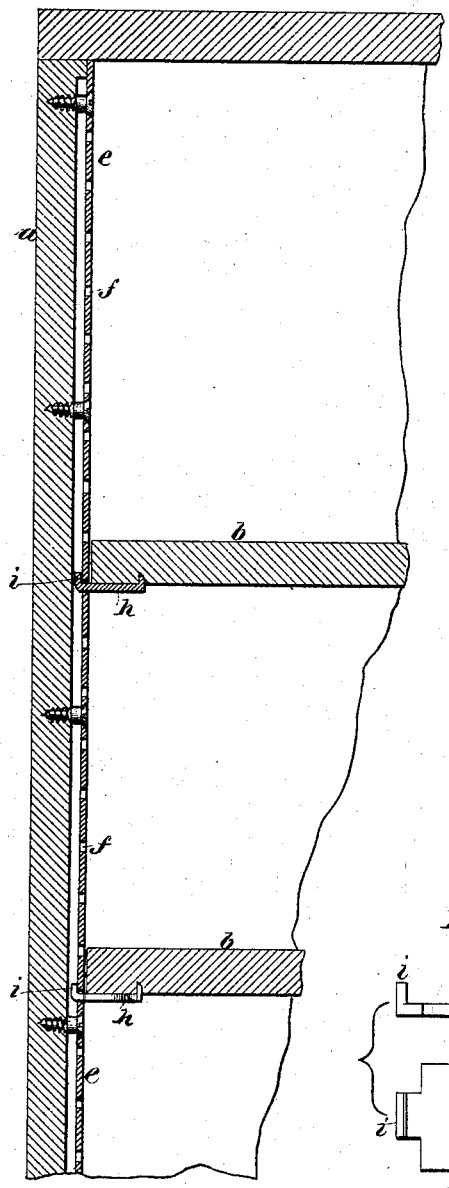


Fig. 5.

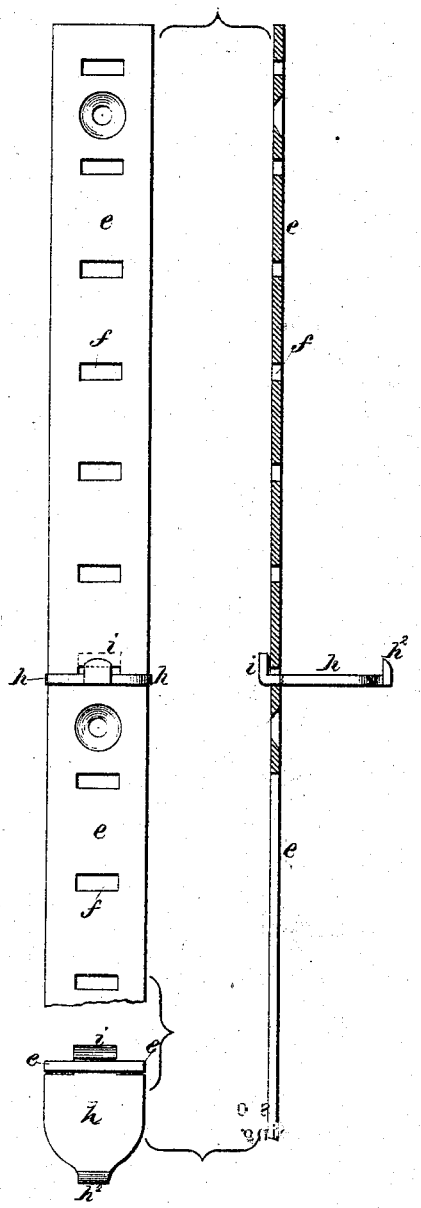
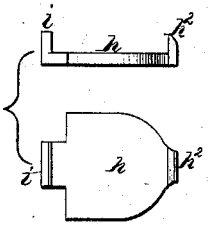


Fig. 6.



Witnesses.

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UNITED STATES PATENT OFFICE.

MATTHEW KER, OF MANSFIELD ROAD, PARISH OF ST. PANCRAS, ASSIGNOR TO WILLIAM HENRY TONKS AND EDMUND TONKS, OF BIRMINGHAM, ENGLAND.

IMPROVEMENT IN DEVICES FOR SUPPORTING SHELVES.

Specification forming part of Letters Patent No. **182,201**, dated September 12, 1876; application filed August 16, 1876.

To all whom it may concern:

Be it known that I, MATTHEW KER, of No. 43 Mansfield Road, in the Parish of St. Pancras, in the county of Middlesex, England, cabinet-maker, have invented new and useful Improvements in Apparatus for Supporting the Shelves of Book-Cases and other shelves, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings.

My invention consists of the improvements hereinafter described in constructing the supporting-studs of the shelves of book-cases and other shelves, and the parts with which the said studs engage; the object of my invention being so to construct the said studs that their engagement with and disengagement from the fixed part of the case or support may be effected with great ease and rapidity. The said studs have the further advantage that when engaged with the supporting parts they are held very securely in their places.

By the use of my invention the fixing and adjusting of the shelves at the required distances apart is effected in a simpler manner, and the shelves are supported more firmly than by the use of the ordinary studs.

In constructing the said studs according to my invention, I give that part of the stud which supports the shelf the figure, by preference, of a truncated cone, but I do not limit myself to any particular figure. At the back of the stud I form a broad, strong hook, the hook part standing above the level of the upper face of the said stud. I attach to each end of the book or other case or support one or more vertical strips of metal, provided with equidistant openings of a size proper to receive the hooks of the studs. Previously to fixing the said vertical metallic strips to the ends of the book or other case or support, a groove is formed in the material to which the strips are to be attached of a depth sufficient for the reception of the hooks of the studs.

In engaging the hooked studs made according to my invention with the supporting metallic strips described, the stud is inclined upward, and the hook part passed through one of the openings in the strip. By lowering the stud into a horizontal position its hook passes to the back of the strip, and the vertical inner face of the hook bears against and hooks itself to the back of the said strip above the opening through which it passed. The stud is by this means fixed very securely in its place, the said stud remaining fixed to the strip so long as the said stud is retained in a horizontal position.

In order to withdraw the stud for adjusting the position of the shelves, it is inclined upward, so as to depress the neck of the hook in the opening. The hook can now be withdrawn through the opening in the strip by a horizontal motion.

I will now describe, with reference to the accompanying drawing, the manner in which my invention may be carried into effect.

Figure 1 represents, in vertical section, a portion of a book or other case, the shelves of which are supported by means of apparatus constructed according to my invention. Fig. 2 represents, in front elevation drawn of the full size, one of the vertical metallic strips with which the studs are engaged and by which they are supported; and Fig. 3 represents a section and plan of the same, with one of the studs applied thereto. Figs. 4, 5, and 6 represent a modification of the stud, as hereinafter explained.

I will first describe the arrangement represented in Figs. 1, 2, and 3. *a a* are the fixed parts of the book or other case, and *b b* are the shelves of the same. *c c* are the supporting-studs of the shelves, that part of the studs which supports the shelves having the figure of a truncated cone, as represented, the shelves having recesses near their ends and under sides to fit upon the said studs. *d* is the broad, strong hook of the conical stud, the said hook standing above the level of the upper face of the stud. (See Fig. 3.) *e e* are the vertical metallic strips, fixed to each end of the book or other case *a a*, the said strips being provided with equidistant openings *f f* to receive the hooks *d* of the studs *e*. Vertical grooves at *g* are made in the fixed ends *a a* of the case, and over these grooves the metallic strips *e e* are fixed by screws, as repre-

sented. The grooves *g* are of a width equal to or slightly greater than the width of the openings *f* for receiving the hooks *d*.

To engage the hooked studs *c d* with the supporting metallic strips *e e*, the stud is inclined upward, and its hook *d* passed through one of the openings *f* in the metallic strip *e*, as indicated in dotted lines in Fig. 3. The stud being then lowered into a horizontal position, the hook *d* passes to the back of the strip, and the vertical inner face at d^2 of the said hook bears against and hooks itself to the back of the strip above the opening *f*, through which it was passed, and the shoulder c^2 bears against the inner side of the strip *e*, below the opening *f*. The stud is thus firmly fixed in its place on the strip by the bearing of the two parts d^2 c^2 on opposite sides of the said strips, there being no tendency in the hook of the stud to escape from the opening in the strip so long as the stud is preserved in a horizontal position, and this horizontal position is retained by the weight of the shelves and the articles carried by them.

When it is required to withdraw the hooked studs for removing or rearranging the shelves, it is only necessary to depress the hooks *d* into the position indicated in dotted lines in Fig. 3, when they may be withdrawn through the openings *f* in the strips by a horizontal motion.

The construction of the hooked studs may be simplified by making them from sheet-iron or other sheet metal, in the manner illustrated in Figs. 4, 5, and 6, Fig. 4 representing the hooked studs and supporting-strips applied to part of a book-case; Fig. 5, the same in front elevation, section, and plan drawn of the full size; and Fig. 6, one of the hooked studs separately. In this modification the flat bodies of the studs are marked *h*, and the hooked parts are marked *i*, the metallic supporting-strips are marked *e*, and the openings in them are marked *f*. The shelves *b* are, in this arrangement, supported upon the flat bodies *h* of the studs, instead of recesses being made in the shelves to receive the conical bodies of the studs, as before described. Each stud *h* has a tooth or point, h^2, at its outer end, which takes into the shelf and holds the latter firmly on the studs. (See Fig. 4.) The flat sheet-metal studs *h i* are engaged with and disengaged from the openings in the metal strips *e e* in the same manner as described with respect to the studs *c d*, Figs. 1, 2, and 3, having conical bodies.

Although I have only shown two forms of the bodies for the supporting-studs, yet I wish it to be understood that I do not limit myself to any particular figure of that part of the studs upon which the said studs are supported; neither do I limit myself to the number of the vertical supporting-strips and hooked studs, but generally I prefer to use two hooked studs at the end of each shelf, and two vertical supporting-strips at the ends of the book or other case or support for receiving and supporting the said hooked studs.

Having now described the nature of my invention, and the manner in which the same is to be performed, I wish it to be understood that I do not limit myself to the precise details herein described and illustrated, as the same may be varied without departing from the nature of my invention; but

I claim as my invention—

The improvements in apparatus for supporting the shelves of book-cases and other shelves hereinbefore described and illustrated in the accompanying drawing—that is to say, the combination of metallic shelf-supporting hooks, formed each with a broad, strong, upwardly-turned hook, as described, with vertical metallic strips attached to each end of the book or other case or support, and provided with openings, with which openings the hooks of the studs are engaged and disengaged, substantially as set forth.

MATTHEW KER.

Witnesses:

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HENRY R. BROERS.