(No Model.) 2 Sheets—Sheet 1.

O. H. L. WERNICKE.

SEPARABLE BOOKCASE.

No. 564,401. Patented July 21, 1896.

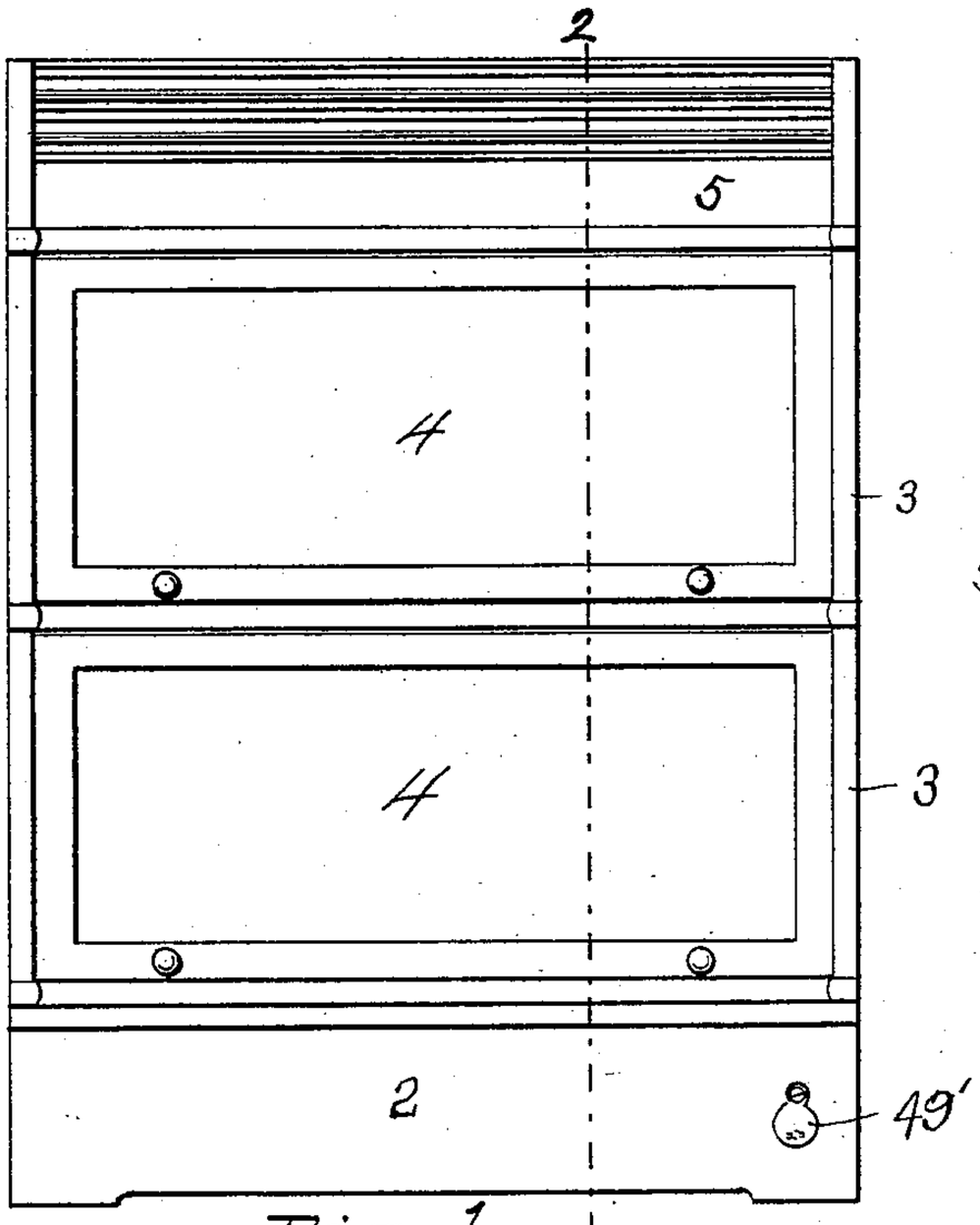

Fig. 1.

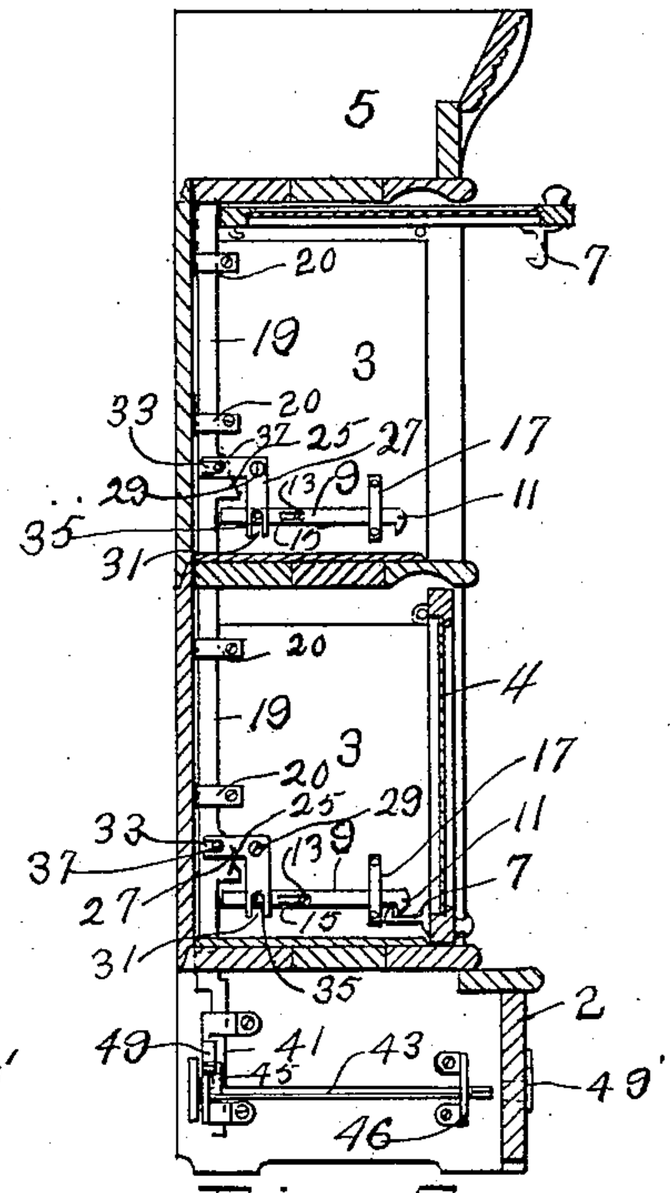

Fig. 2.

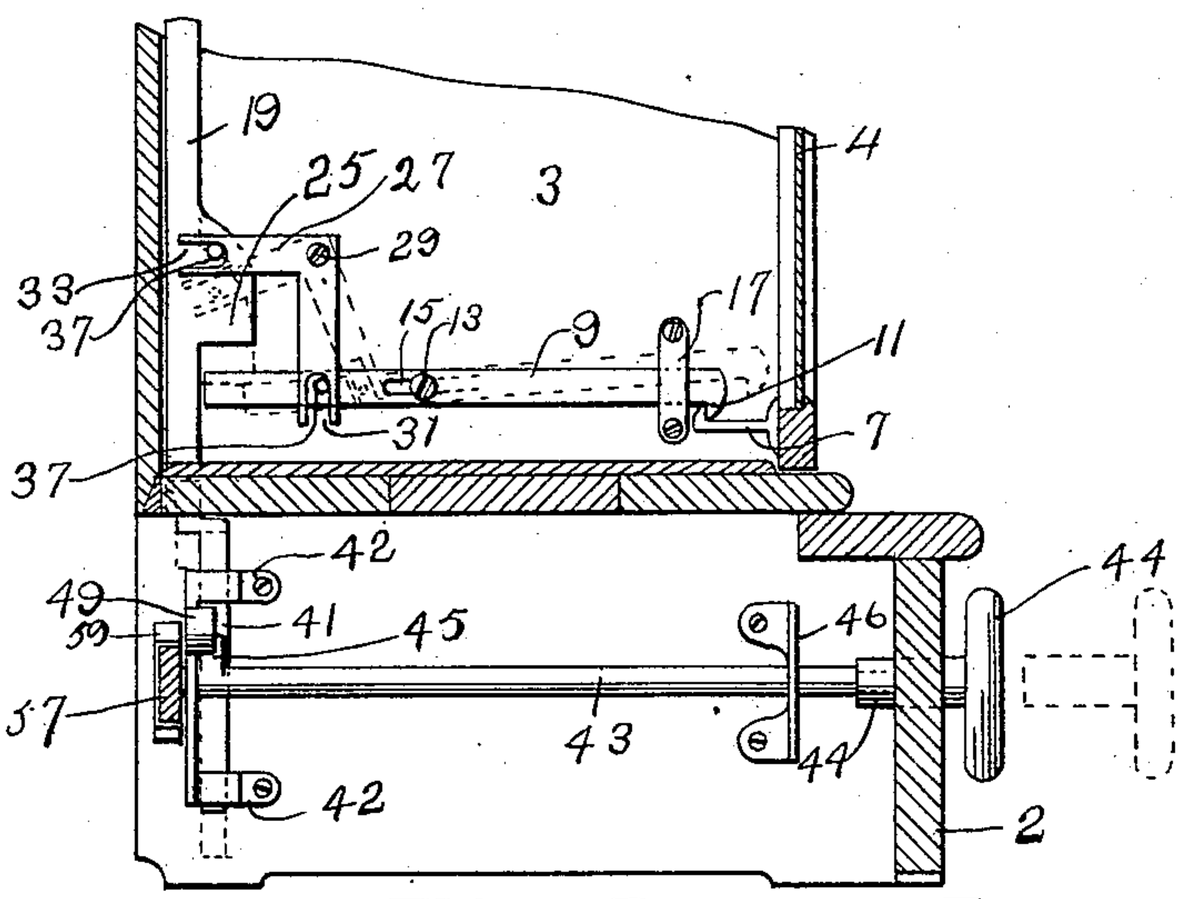

Fig. 3

Witnesses
B. P. Shepherd
H. E. Gooley

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(No Model.) 2 Sheets—Sheet 2.

O. H. L. WERNICKE.

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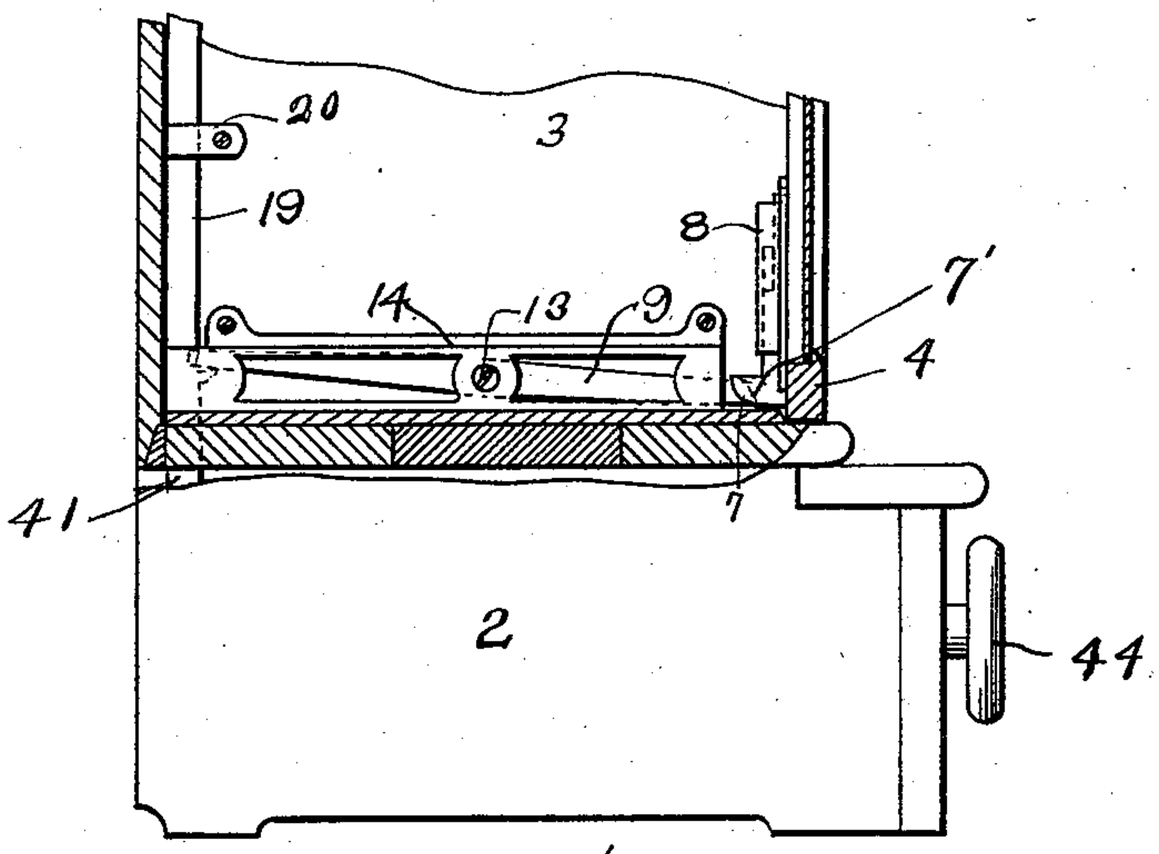

Fig. 4.

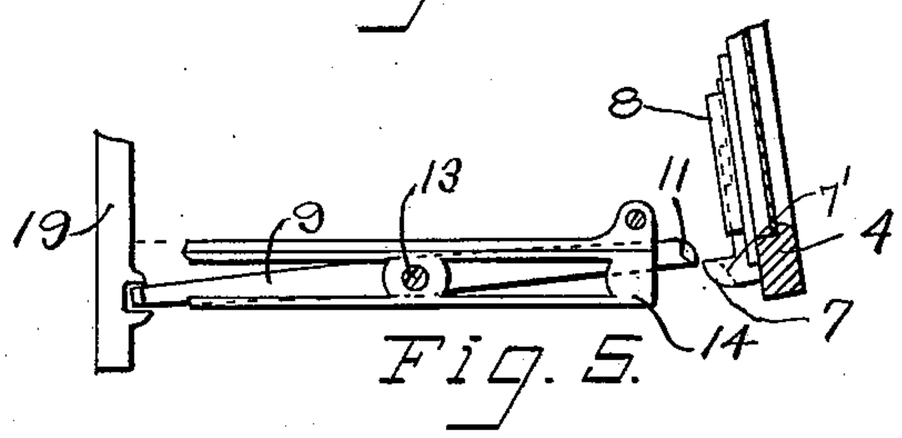

Fig. 5.

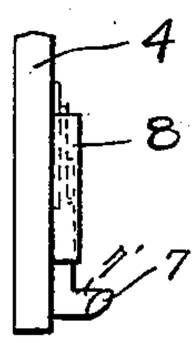

Fig. 6.

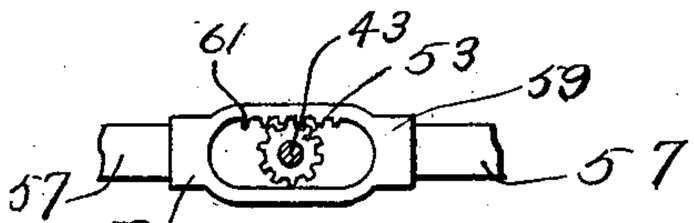

Fig. 7.

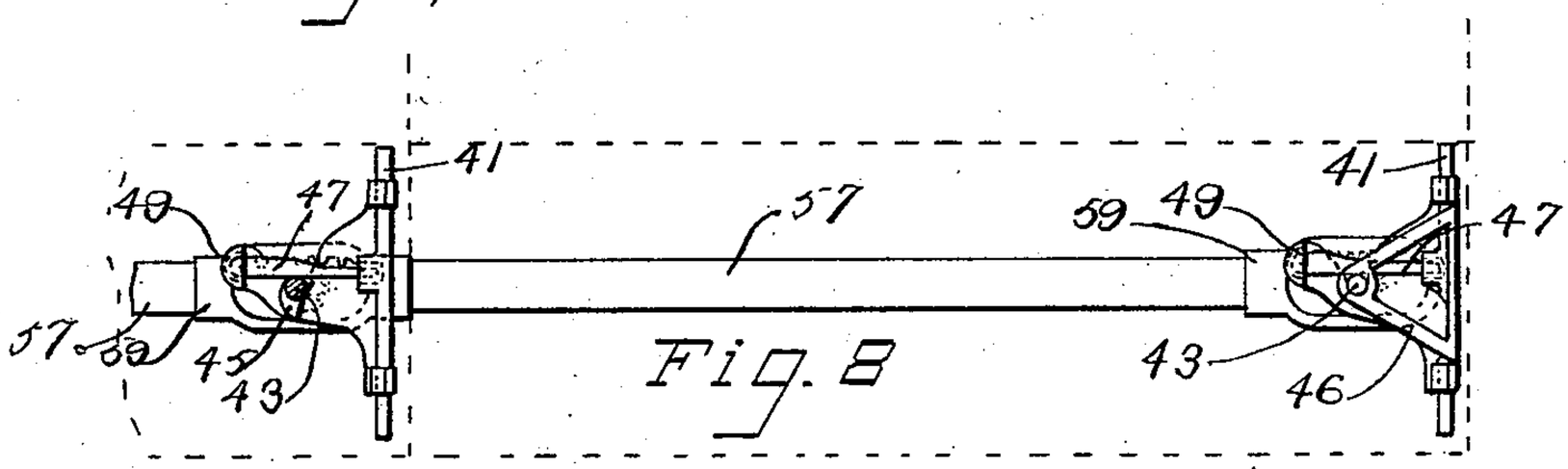

Fig. 8

Witnesses
B. P. Shepherd
M. E. Foley

Inventor
Otto H. L. Wernicke
By Paul & Hawley
his attorneys

UNITED STATES PATENT OFFICE.

OTTO H. L. WERNICKE, OF MINNEAPOLIS, MINNESOTA.

SEPARABLE BOOKCASE.

SPECIFICATION forming part of Letters Patent No. 564,401, dated July 21, 1896.

Application filed April 6, 1896. Serial No. 586,405. (No model.)

To all whom it may concern:

Be it known that I, OTTO H. L. WERNICKE, of the city of Minneapolis, county of Hennepin, State of Minnesota, have invented certain new and useful Improvements in Separable Bookcases, of which the following is a specification.

This invention relates to improvements in separable bookcases, and particularly to separable bookcases having doors hinged at their upper edges to the front of each section and adapted to be turned up into a substantially horizontal position and then pushed back over the space containing the books; and the invention consists, generally, in means for locking the doors of a bookcase of this kind by mechanism that permits all of said doors to be simultaneously locked.

The invention consists, further, in the constructions and combinations, all as hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a front elevation of a bookcase embodying my invention. Fig. 2 is a transverse vertical section on the line 2 2 of Fig. 1. Fig. 3 is a detail section on a larger scale than that shown in Fig. 2. Figs. 4, 5, and 6 are details showing a modified construction of the lock. Figs. 7 and 8 are details showing the means for connecting the locking devices of two or more tiers of crates or sections.

It will be understood that while I have referred to the case herein shown and described as a bookcase, it is adapted for holding many other articles. It may be used in place of the ordinary shelving in dry-goods stores, grocery stores, butlers' pantries, and other places, and hence I do not limit myself to the use of this device for any particular purpose. For convenience, however, in this description I describe the device as a bookcase.

In the drawings, 2 represents the base, 3 3 sections, and 5 the top of a sectional case constructed in accordance with my invention. Any number of sections 3, all of which are preferably made interchangeable, may be employed to constitute the case. These sections may be piled one upon another, as shown in Figs. 1 and 2 of the drawings, and other tiers of sections may be arranged end to end with the sections 3, all of said sections being provided with means for locking the doors thereof, as hereinafter described. I have shown a case of this character in Patent No. 557,736, issued April 7, 1896, to M. C. Burr and myself, and in Patent No. 557,737, also issued April 7, 1896, to myself.

I provide each section of the crate with means arranged thereon which will lock the door 4 of that particular crate and which will coöperate with the locking devices of each of the other crates. I also provide means for connecting the locking devices of one set or tier of crates or sections with the locking devices of one or more adjoining tiers of crates, so that all of said locking devices will be simultaneously operated.

The mechanism for locking each individual crate, and which, it will be understood, forms a part of said crate and does not interfere with the piling up of said crates or their removal, will be best understood by referring to Figs. 2 and 3 of the drawings. As here shown, each door 4 is provided near its lower edge with a suitable hook 7, the end of which is turned upwardly; and upon the inner wall of the end of the crate I provide a bar 9, having upon its end a hook 11, adapted to interlock with the hook 7 upon the door of the crate for the purpose of fastening said door in its closed position. This bar is preferably pivoted by a suitable pivot-pin 13, passing through a slot 15 in said bar, to the end wall of the crate, and this slot permits a horizontal movement of the bar upon the pivot-pin 13, and the pivot is preferably placed at a point that is nearer to the back end of the bar than to the forward end, so that the forward end of said bar that is provided with the hook 11 overbalances the other end of the bar and tends to hold the hook 11 down in engagement with the hook 7, or the same result may be obtained by making the front end of the bar heavier than the rear end. A suitable guide 17 is provided upon the inner wall of the crate 3 near the forward end of the bar 9, and said guide causes said bar to rise and fall in a vertical plane and limits the movement thereof. This guide might be dispensed with, however, and any other suitable

means be employed for causing the hook upon the end of the bar 9 to come in proper alinement with the hook 7 upon the door 4.

I provide each crate with a vertically-sliding bar 19, preferably located in the back corner of said crate and extending through the bottom plate of said crate, or being capable of extending through a suitable slot in the bottom plate of said crate. Where a number of crates are used these bars will all stand in the same perpendicular line and the lower end of each bar 19 will rest upon the top end of the next bar below, and I prefer to form the end of each bar either at the top or bottom with a recess preferably of conical form, and to provide the opposite end of each bar with an end corresponding thereto and adapted to fit into said recess. This aids in holding the bars in correct alinement.

Any suitable means may be used for holding the bars 19 in position, though I prefer to use suitable cleats 20, secured to the wall of the crate, as shown in Fig. 2. Each bar 19 is provided upon its forward side with a projection 25 that extends over the end of the bar 9 and is adapted, when said bar 19 is depressed by its own gravity, to encounter the rear end of the bar 9, turning said bar upon its pivot 13 and raising the forward or hook end of said bar, as indicated by dotted lines in Fig. 3. A bell-crank lever 27 is pivoted at 29 upon the end wall of the section, and is provided with the slotted end 31 and 33, engaging pins 35 and 37, respectively arranged upon the bar 9 and upon the projection 25 upon the bar 19.

I preferably provide the base 2 of the case with a vertically-operating bar or rod 41 that is adapted to engage the lower end of the bar 19 in the lower crate 3. A shaft 43 is journaled in suitable bearings in the base 2 of the case. This shaft is provided near its rear end with a cam 45. A lever 47 is pivoted upon a suitable stationary support 49, and its free end engages the upright rod 41 so that whenever said shaft 43 is turned upon its axis the cam 45 thereon engages the lever 47 and raises the rod 41, causing it to engage with the lower rod 19 and to move all of the rods 19 in the vertical tier of crates above the base 2. I provide the shaft 43 with the cam 45 for the express purpose of permitting it simultaneously to raise all of the bars in the crates above. The shaft 43 preferably does not extend through the front wall of the base 2, but is preferably provided at its forward end with a squared portion adapted to receive a key 44 having an aperture adapted to fit the forward end of said shaft, said key being adapted to be inserted through an opening in the front wall of the base. When the key 44 is removed the opening in the front wall of the case is closed by means of a pivoted plate 49′ and a suitable lock.

The operation of the device is as follows: The parts being in the position shown in Fig. 3 of the drawings, if it is desired to unlock the tier of crates above said base the key 44 is inserted and made to engage with the shaft 43, and said shaft is then turned upon its axis, thereby causing the cam 45 to permit the lever 47 and the rod 41 and all of the rods 19 in the crates that are arranged above the crate 2 to move downward. The first downward movement of the lever 19 causes the bell-crank lever 27 to turn upon its pivot and to push forward the levers 9 out of engagement with the hooks 7. The further movement of the rod 19 brings the projection 25 thereon against the rear end of the lever or bar 9, depressing the rear end of said lever and elevating the forward end and carrying the hook 11 above and out of the path of the hook 7.

An upward movement of the bar 19 causes a reversal of the movement of the bar or lever 9. In this instance the forward end of the bar 9 drops vertically, and the further movement of the bar 19 through the bell-crank lever 27 draws back the lever 9 horizontally so as to bring the hook 11 thereon into close engagement with the hook 7, and this movement of the bar 9 will insure the complete closing of the door.

Should any of the doors be open when the device is moved into position to lock the doors, it will make no difference in the operation, as on the closing of the door the hook 7 will ride under the hook 11, raising the forward end of the bar 9, and when the door is fully closed the hook 11 will, by gravity, fall into engagement with the hook 7.

Where a bookcase is used consisting of several tiers of sections arranged with their ends abutting one against the other when locked together, I prefer to provide means for simultaneously locking all of the doors of all of the crates or sections. For this purpose I provide the rear end of the shaft 43 with a suitable pinion 53, and the bar 41, which is preferably secured to the wall of the base by suitable cleats 42, is preferably arranged in front of said pinion or substantially in line with the cam 45 upon the shaft 43. The forward end of the shaft 43 is provided with a suitable support, such, for example, as a bracket 46, (shown in Figs. 2 and 3), secured to the wall of the base. It will be understood that there will be a shaft 43 and a corresponding bar 41, as shown in Fig. 8, arranged in each base, and each of said shafts being provided with a pinion 53, a connecting bar 57 will be arranged to extend from one crate to the next one, and to engage the pinions 53 upon the shafts 43. As here shown, each of said bars 57 is provided with a loop portion 59, having a series of teeth 61, and the end of the shaft 43 extends into said loop, and said pinion 53 on said shaft engages the gear-teeth 61 in said loop 59. By this means, if any one of the shafts 43 is turned, all of the shafts that are connected therewith by the connecting-bars 57 will be

simultaneously turned, and thereby all of the locking devices will be simultaneously operated.

It will be noted that I may use levers 9 of standard length for all sizes of crates, it being necessary only on the deeper crates to provide rods 19 having deeper projections 25, so that said projections will always upon downward movement of the rods 19 engage the rear end of the lever 9.

Instead of using the lever 9 of the form shown in Figs. 2 and 3 of the drawings, I may, in some instances, use the lever 9 shown in Figs. 4 and 5. In this instance the lever 9 does not have any longitudinal movement upon its pivot 13, but as here shown, it is arranged within a casting 14 which forms a guide therefor, and the rear end of the lever is engaged directly by projections upon the rod 19. The hook 11 upon the lever 9 is upon the side thereof, as shown in Fig. 5, and engages the vertically-sliding or gravity hook 7 that is secured upon the inner side of the door 4, the projecting part of the hook in this instance being at the side so as to engage with the side hook 11 upon the lever 9. The shank of the hook 7 is arranged in a guide 8 secured upon the door, and this permits the hook 7 to have a rising and falling movement, so that when the locking mechanism is set for the purpose of locking the doors, before the door is closed, the end of the hook 7 will engage the outer end of the hook 11 and will ride over said hook and drop into place behind it.

The face 7′ of the hook 7 is beveled and inclined, as shown in Fig. 6 of the drawings, so that when the forward end of the lever 9 is depressed, the beveled face of the hook 11 will ride down over the face 7′ and draw the door completely to a closed position. Where there are a multiplicity of doors, all to be locked simultaneously, it is important that sufficient allowance be made for the fact that the various doors may not all close normally to the same degree, as some of the doors may become more or less warped or out of true. I provide for this contingency by having the locking-levers 9 arranged with a beveled face, as shown in Figs. 4 and 5, or as shown in Figs. 2 and 3, by giving to the end of the lever two movements, first, a movement in a vertical direction to bring the hook on the lever into line with the hook on the door, (and this will be done even though the door is not fully closed,) and, second, an inward or horizontal movement, which, in case the door is not fully closed, will draw it to a closed position. This permits the locking device to engage and lock the door without requiring any arbitrary point of engagement, and insures the proper locking of one of the doors even though there may be considerable variation in the positions which they normally assume when turned down over the front of the crate.

There are, in fact, many different constructions of devices that I might employ in place of the hook 7 and the lever 9, and the devices coöperating therewith; hence I do not desire to be limited to the details of the mechanism herein shown and described.

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

1. A case for books or other articles comprising a series of independent crates or sections adapted to be piled one upon another and each provided with a door, hinged at its upper edge and adapted to be turned down to close the front of said crate or section, and a locking mechanism arranged in each crate for locking said door in its closed position, the locking mechanisms being arranged to coöperate with each other, whereby the same are simultaneously operated.

2. A case for books or other articles, comprising a series of independent crates or sections, each provided with a suitable door, said sections being adapted to be placed one on top of another, and each section being provided with an independent door-locking mechanism arranged to be moved by the movement of the locking mechanism of the adjacent crate.

3. A case for books or other articles, comprising a series of crates or sections each provided with a suitable door, a locking mechanism for said door, and a vertically-movable operating-rod in each crate arranged to operate the locking mechanism of its crate and to move the operating-rod of the superimposed crate.

4. The combination, with the crate or section having an open front and provided with a door hinged at its upper edge, of the vertically-movable operating-rod 19 arranged in said section, a locking mechanism for locking said door in its closed position, and connections between said locking mechanism and said operating-rod, for the purpose specified.

5. The combination, with the crate or section provided with an open front and with a door hinged at its upper edge to said plate or section, said door being provided with a suitable hook 7, of the locking-lever 9 arranged to engage said hook, and the operating-rod 19 connected to said lever.

6. The combination, with the series of crates or sections, each provided with a door hinged at its upper edge and adapted to be turned down to close the front of said section, a locking mechanism in each section arranged to engage and lock said door, an operating-rod in each section arranged to move said locking mechanism, the rod in each section being arranged to engage the corresponding rod in the superimposed section, whereby all of said locking mechanisms are simultaneously operated.

7. The combination, in a case for holding books or other articles, of a suitable base, a series of independent crates or sections adapted to be placed one upon top of another, and all

supported upon said base, each of said crates or sections being provided with a door hinged at its upper edge and adapted to close the front of said crate or section, a locking mechanism in each crate or section for locking the door thereof, and means arranged upon said base for simultaneously operating all of said locking mechanisms.

8. The combination, with the crate or section provided with the door having a suitable hook 7, of the lever 9 provided with the slot 15 and pivoted upon a suitable pivot 13, and provided also with the hook 11 arranged to engage the hook 7 upon the door of the section, the vertically-movable operating-rod 19 provided with the projection 25 and adapted to engage the rear end of the lever 9 when said operating-rod is depressed, and the bell-crank lever 27 connected to said rod 19 and the lever 9.

9. The combination, with the case composed of a series of crates or sections arranged to be secured one upon top of another, of locking mechanism in each crate for locking the door thereof, and means for simultaneously operating all of said locking mechinism.

10. The combination, with a crate or section, provided with a door hinged at its upper edge, said door being provided near its lower edge with a suitable hook or projection, a lever arranged to engage said hook, and means for giving to said lever, after such engagement, an inward or horizontal movement for the purpose of drawing said door to a closed position.

11. The combination, with a crate or section, provided with a door hinged at its upper edge and adapted to turn down into a vertical position to close the front of said crate or section, of a locking device arranged to engage said door when the door is not fully closed and to draw it to a closed position, for the purpose set forth.

In testimony whereof I have hereunto set my hand this 28th day of March, A. D. 1896.

OTTO H. L. WERNICKE.

In presence of—

A. C. PAUL,

M. E. GOOLEY.