

(No Model.)

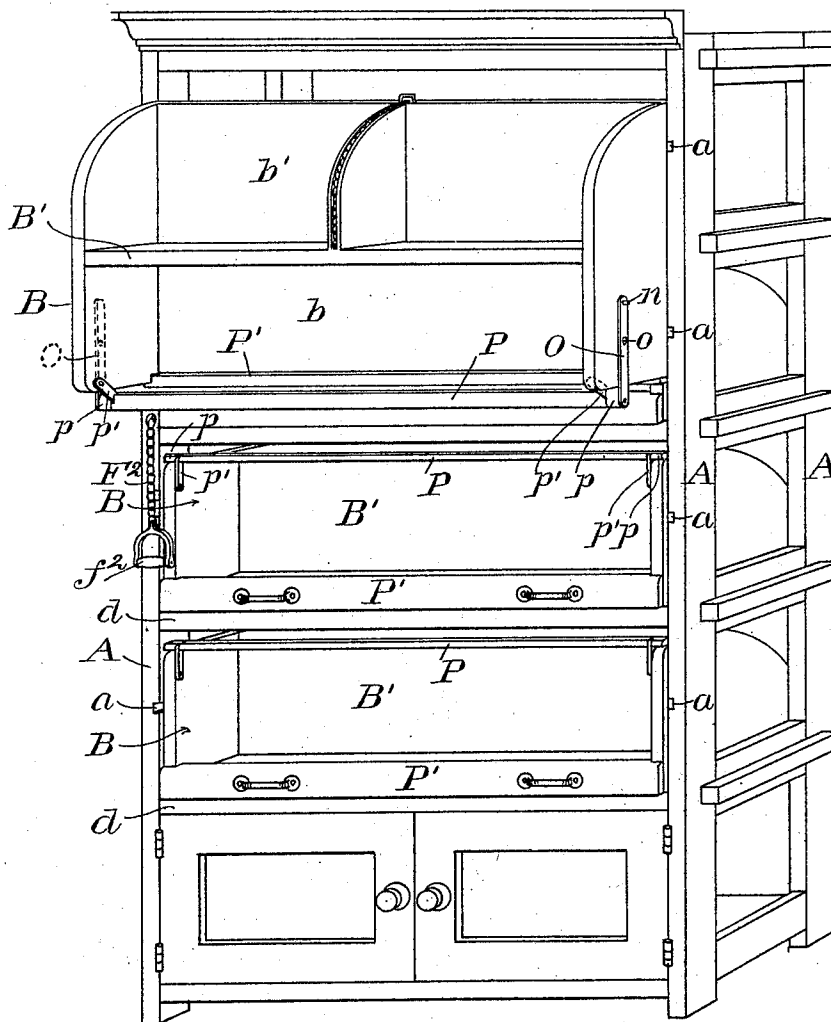
3 Sheets—Sheet 1.

W. G. BROWN & J. L. MERRILL.
BOOKCASE.

No. 580,844.

Patented Apr. 20, 1897.

Fig. 1.



Witnesses:

J. W. Fisher.
Grace T. Many.

Inventors,
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Fig. 2.

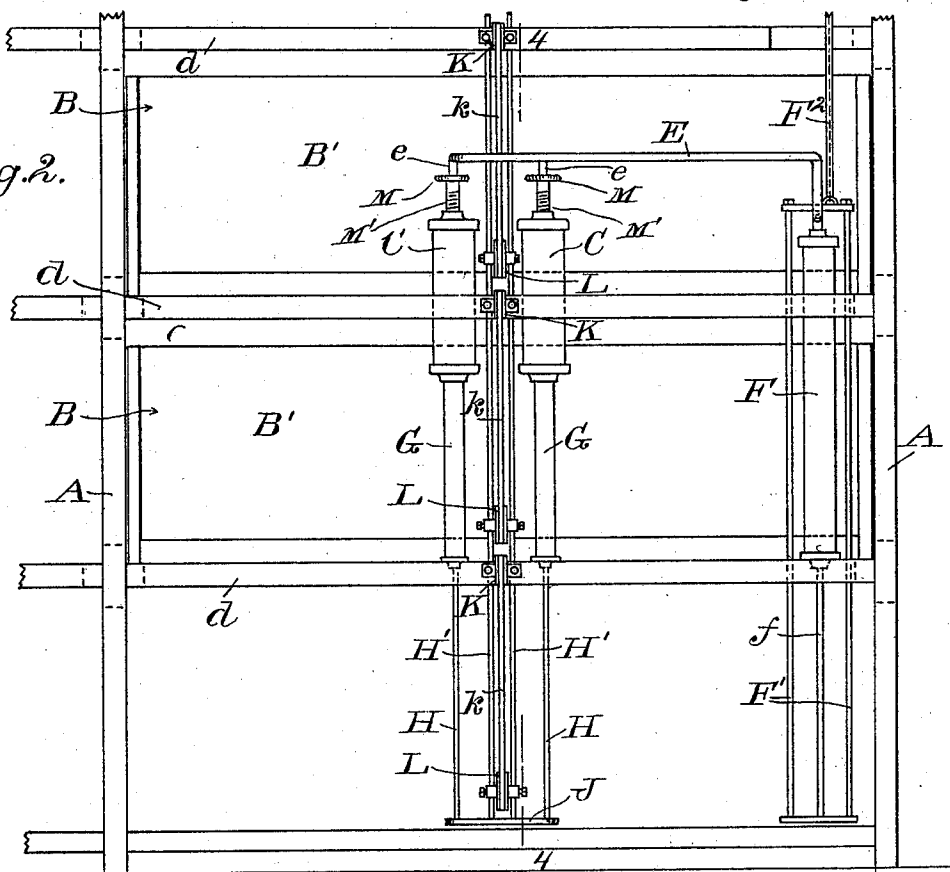
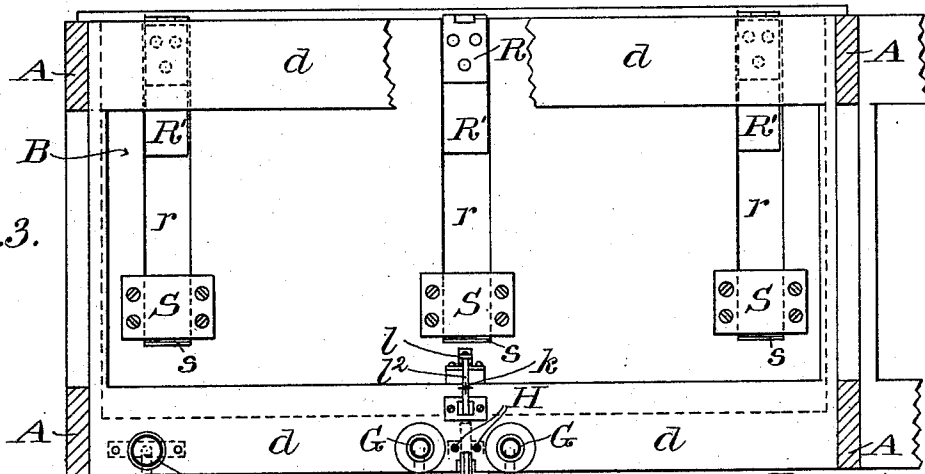


Fig. 3.



Witnesses:

J. W. Fisher.
Grace T. Many.

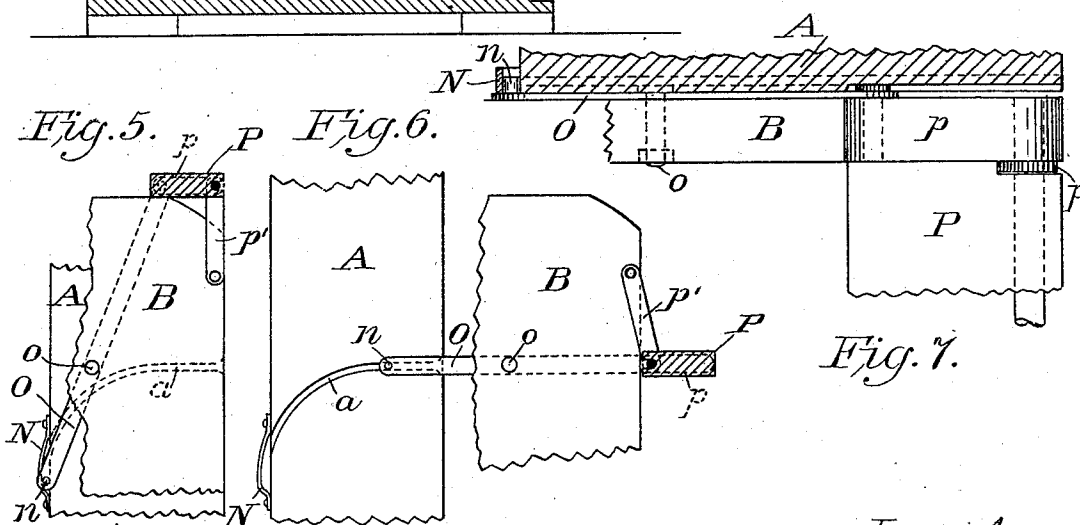
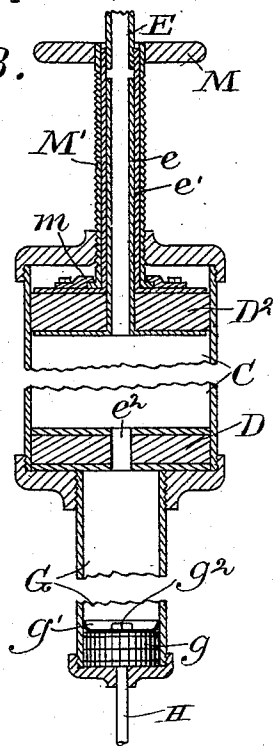
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3 Sheets—Sheet 3,

BOOKCASE.

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UNITED STATES PATENT OFFICE.

WILLIAM G. BROWN, OF ALBANY, AND JOSIAH L. MERRILL, OF
SCHENECTADY, NEW YORK.

BOOKCASE.

SPECIFICATION forming part of Letters Patent No. 580,844, dated April 20, 1897.

Application filed November 16, 1896. Serial No. 612,187. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM G. BROWN, residing in the city and county of Albany, and JOSIAH L. MERRILL, residing in the city and county of Schenectady, State of New York, citizens of the United States, have invented a new and useful Improvement in Bookcases, of which the following is a specification.

Our invention relates to improvements in cases or cabinets for holding books; and the object of our invention is to provide a bookcase in which the shelves are arranged to hold two or more tiers of books, one in front of the other, and which shelves may be drawn out, allowing the books placed behind the rows or tiers normally in front of the case to come in view and be removed or replaced. We attain this object by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view, the top shelf being pulled forward and turned down. Fig. 2 is a rear elevation. Fig. 3 is a section along the line 3 3 on Fig. 4, looking from the under side. Fig. 4 is a section along the line 4 4 on Fig. 2. Fig. 5 is a detail view of the book-retaining mechanism. Fig. 6 is a detail view of the book-retaining mechanism. Fig. 7 is a section through line 7 7 on Fig. 4, and Fig. 8 is a section through one of the cylinders.

Similar letters refer to similar parts throughout the several views.

In order to provide a bookcase in which books may be placed as compactly as possible, we have arranged shelves which may be drawn out and turned downward, allowing a row of books to be placed in the rear of what is the front row before the shelf has been drawn out and turned downward, and which books will be presented in the same general form and arrangement as a row of books ordinarily assumes in a bookcase. In order to arrange shelves which may be thus adapted to hold a tier of books in the rear of the row as ordinarily placed, it is necessary to provide a means for holding the front row when the shelf has been turned downward; also, to provide a force or power to assist in operating the shelf when heavily loaded with books. It is also advisable to arrange the

apparatus in such a manner that but one shelf may be withdrawn at a time.

The means which we have devised for the purpose of operating our invention can be best understood by referring to the drawings herein, in which—

A represents the bookcase-frame; B, the shelves therein, which shelves have a front portion *b* and a rear portion *b'*, separated by a partition *B'*.

At the rear of the bookcase we arrange two cylinders C C, each provided with an adjustable piston, or rather an adjustable head *D*² of the cylinder, (see Fig. 8,) which carries a pipe *e*, passing through said adjustable head *D*², communicating with the interior of the cylinder and connected at its opposite end with the pipe E, which pipe E is connected with the cylinder F. Enveloping the pipe *e* we arrange the pipe *e'*.

For the purpose of adjusting the adjustable piston or cylinder head *D*² to limit the capacity of the cylinder we arrange the hand-wheel M upon a threaded pipe M', enveloping the pipe *e'* and connected to the cylinder-head by the socket *m*, by the operation of which the adjustable piston-head *D*² may be raised or lowered. Suitable packing is placed about the pipes and their connections to prevent escape of air. Within the cylinder C we also place the piston D, provided with a concentric aperture *e*², communicating with the pipe G and the interior of the cylinder. A piston *g* reciprocates within the pipe G and carries a cup *g'* and projecting nut *g*², adapted to engage with the piston D in such a manner that the nut *g*² will close the opening *e*² therein, the cup *g'* acting as a gasket sealing the opening and preventing leakage when force is applied to the piston *g*. The piston *g* is secured to a piston-rod H, which rod extends through an opening in the end of the pipe G and is secured to a cross-bar J, to which bar the corresponding piston-rod H is secured. As thus constructed when the piston *g* is acted upon the air within the pipe G will become compressed to a slight degree, the small opening *e*² allowing for an escape. When the piston reaches the piston D, the rapidity of the piston-rod H will be retarded. The air within the cylinders will pass out through the pipe

e into the pipe *G* and from thence into the cylinder *F*, which is of sufficient capacity to hold the contents of the two cylinders *C C*.

The operation of the cylinders is apparent. 5 When the piston *g* is forced toward the cylinder-chamber, the air within them acts as a cushion, but escapes into the large cylinder *F*. The adjustable cylinder-head or piston *D*² renders it convenient to adjust the cham- 10 bers in such a manner that the amount of pressure may be regulated to the demand. The cylinder *F* is provided with a piston connected with the rod *f*, operated by the rods *F'*, which are connected with a chain *F*², upon 15 the end of which is the handle *f*², so that when the chain is drawn, forcing the piston-rod *f* into the cylinder *F*, the air therein is returned to the cylinders *C C*, pressing downward the rods *H H*. The application of this device is 20 illustrated in Fig. 4.

We arrange at the rear of each shelf-support *d* a sheave *K K*, about which is a rope or chain *k*, which is secured at one end to the upper rear portion of the shelf *B*, as at 25 *T*, and retained in connection with the rear of the shelf by suitable staples and passes over a pulley *L*, secured to the pulley-rods *H'*, and is fastened at its opposite end to the catch-lever *l*². The pulley-rods *H' H'* are secured 30 at their lower end to the cross-bar *J*. When the shelf is withdrawn to the position shown by dotted lines in Fig. 4, the pulley *L* and pulley-rods *H' H'* will be raised and the piston-rods *H H* forced upward, thus pressing 35 the pistons *g g* upward toward the chamber of the cylinders *C C* until the pulley *L* assumes the position shown by dotted lines in Fig. 4 and the air has been forced out of the cylinders *C* into the large cylinder *F*. Thus the 40 cylinders act as a cushion and allow for the withdrawal of the shelf and its adjustment to the position shown by dotted lines in an easy and steady manner. The catch *l* projects slightly above the drawer-support *d* in contact with the bottom of the shelf in a slot *l'* 45 therein. The chain or rope *k* is attached to the catch or to the pivoted arm *l*², connected therewith in such a manner that when the chain or rope is pulled upon the catch will 50 be withdrawn from the slot *l'* and the shelf liberated.

By arranging the pulleys *L L* to operate in connection with the piston-rods *H H* adjacent to each section of shelves but one shelf is 55 liberated at a time, the others remaining locked, therefore preventing a shelf from being pulled out when there is no air in the cylinders *C C* to act as a cushion.

At the outer edge of the support *d* we countersink one wing *R* of a hinge, the other wing or side *R'* of the hinge adapted to fold over and to lie upon the support *d*. We continue 60 the groove *r*, within which the hinge is countersunk, and to the bottom of the shelf we secure the plate *S*, having a projection *s*, 65 which will fit within the slot *r*. Thus when the shelf is withdrawn to the extent that the

plate *S* or its projection *s* comes in contact and engages with the wing *R'* of the hinge 70 further longitudinal movement of the shelf is prevented and the hinge will open and the shelf will swing on the hinge and will take the position shown by dotted lines in Fig. 4.

In order to prevent the books which are usually in the front row and which when 75 the shelf has been pulled out and turned downward would by gravity be thrown to the floor from being displaced, we arrange the book-retaining device illustrated particularly in Figs. 5, 6, and 7. Thus we cut in 80 the side of the frame *A* a groove *a*, describing the arc of a circle, adapted to allow for the reciprocation therein of a pin *n*. The groove *a* preferably extends to the rear of 85 the side board of the frame *A*, as shown in Fig. 6, and is allowed to pass downward in the rear of the side board and is retained in position by a bracket *N* or in any suitable man- 90 ner. The pin *n* is attached to a lever *O*, which is fulcrumed at *o* to the side of the shelf and which is pivoted at its end to the link *p*, secured to the strip *P*, which link *p* is 95 also pivoted with a link *p'*, pivoted at one side to the side of the shelf. Thus when the shelf is moved forward, which may be accomplished 100 by the use of the handle-strip *P'*, the pin *n* passes through the slot *a*, the lever *O* assumes a horizontal position, and the strip *P* is moved along the face of the shelf a short distance, assuming the position shown in Fig. 6, re- 105 taining the books on the front of the shelf, and when the shelf is placed downward the books rest against the strip *P* and the handle-strip *P'* and are prevented from falling onto the floor.

For the purpose of placing the shelf back to its normal position we have the chain *F*², which is secured to the rods *F' F'*, attached to the piston-rod *f*, arranged to be placed near 110 the side of the bookcase in any convenient position where the same may be drawn upon, forcing the piston within the cylinder *F*, driving the air into the small cylinders *C C*, which will in turn force downward the piston *g* and 115 therefore the pulleys *L*, which will draw into position the shelves *B*.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In a bookcase, an adjustable shelf composed of two divisions, one in the rear of the 120 other, adapted to hold books, in combination with an adjustable retaining device consisting of a strip connected with a lever, said lever provided with a pin adapted to reciprocate within a grooved slot in the side of the 125 frame of the case so connected and adjusted that when the shelf is turned outward and downward, the strip will automatically place itself before the row of books in one compartment of the shelf and will hold them in position, with a means for withdrawing said shelf 130 from the case and holding it suspended, substantially as and for the purpose herein described.

2. In a bookcase, an adjustable shelf in combination with two or more cylinders arranged in series, said cylinders provided with pistons, the piston of one of said cylinders so
5 connected with said adjustable shelf that when the shelf is drawn out, the air within said cylinder will become compressed, act as a cushion and will ultimately be discharged into the other of said cylinders, from thence
10 may be returned to the first-mentioned cylinder and operate to return the shelf to its normal position, substantially as described and for the purpose set forth.

3. In a bookcase, an adjustable shelf, a
15 means for operating said shelf consisting of a cylinder provided with an adjustable head, a pipe connecting the interior of said cylinder through said adjustable head with a larger cylinder, a piston in said smaller cylinder
20 within which a piston smaller than the piston-head in said smaller cylinder is adapted to reciprocate, all so connected up that the operation of the piston within said pipe will cause the contents of the pipe to become com-
25 pressed to a slight degree and when the piston within the pipe is in connection with the piston within the cylinder, the movement of the piston-rod will be retarded and the contents of the smaller cylinder will be discharged into
30 the larger cylinder, all substantially as described and for the purpose set forth.

4. In a bookcase, an adjustable shelf, a resilient retaining device connected to said shelf within said case, said retaining device
35 supporting said shelf when partly withdrawn from said case, with a means for tilting said shelf in such a manner that what is normally the front of the shelf becomes in the tilted

position, the bottom or lower portion thereof, substantially as described and for the purpose
40 set forth.

5. In a bookcase, an adjustable shelf adapted to be partly withdrawn and suspended from the case, with suitable cylinders connected by pistons to rods adapted to recip-
45 cate within bearings attached to the bookcase, said rods carrying suitable pulleys, a rope or chain attached to the upper rear portion of each shelf, said rope or chain passing over one of said pulleys, its opposite end attached
50 to said case, so arranged that the shelf may be drawn out and the rope or chain will act upon the rods attached to the pistons of the cylinders in such a manner that the contents
55 of the cylinders will act as a cushion, substantially as described and for the purpose set forth.

6. In a bookcase, an adjustable shelf, a hinge having one wing thereof secured to the support of said shelf, with a projection on the
60 bottom of the shelf adapted to engage with the other wing of said hinge when the shelf is drawn out to a certain degree and after such action between said projection and the
65 wing of said hinge, the withdrawal of the shelf tending to tilt the same and swing it forward and downward, with a means for cushioning the movement of said shelf after engagement is made with said hinge, sub-
70 stantially as described and for the purpose set forth.

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Witnesses:

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