(No Model.) 3 Sheets—Sheet 1.

# F. H. HALEY.

## REVOLVING CASE FOR BOOKS.

No. 497,657. Patented May 16, 1893.

Fig. 13.

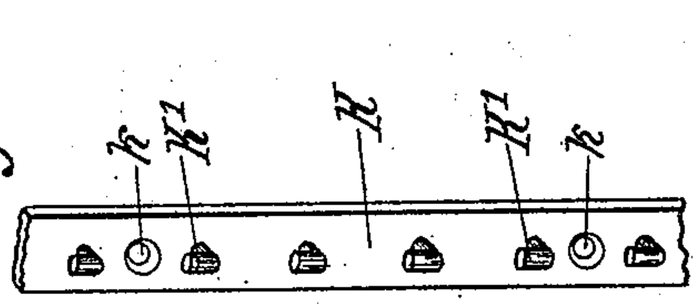



Fig. 14.

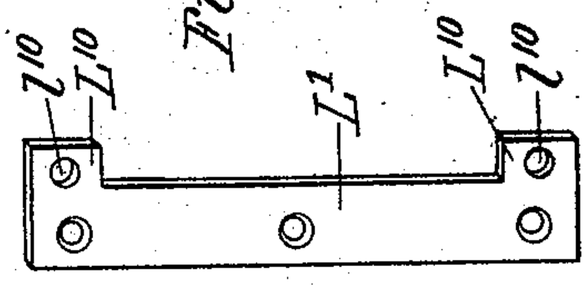
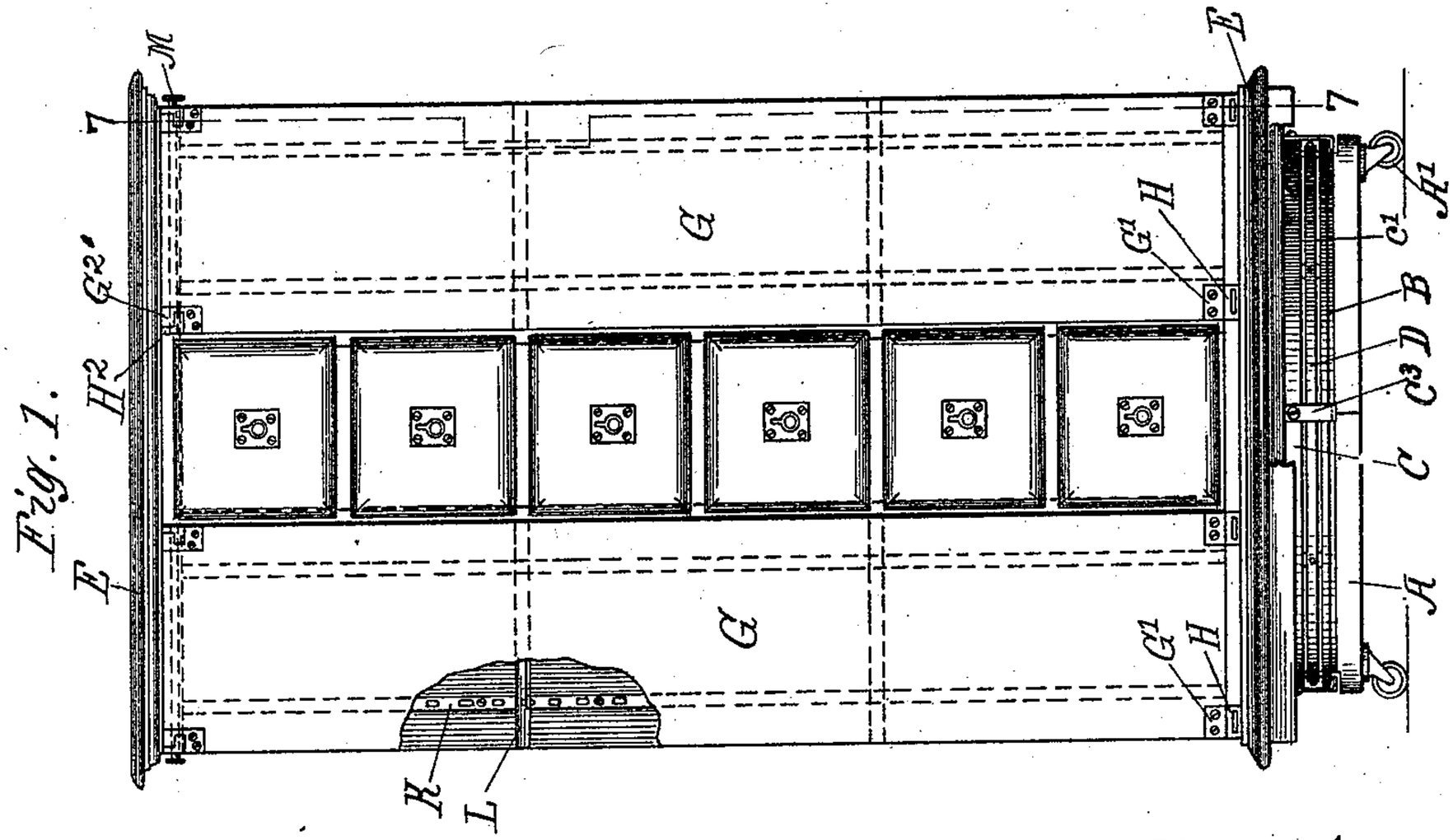



Fig. 1.




Witnesses.
E. T. Wray.
Jean Elliott.

Inventor.
Fred H. Haley
By Burton & Burton
his attys.

(No Model.) 3 Sheets—Sheet 2.

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## REVOLVING CASE FOR BOOKS.

No. 497,657. Patented May 16, 1893.

Fig. 2.

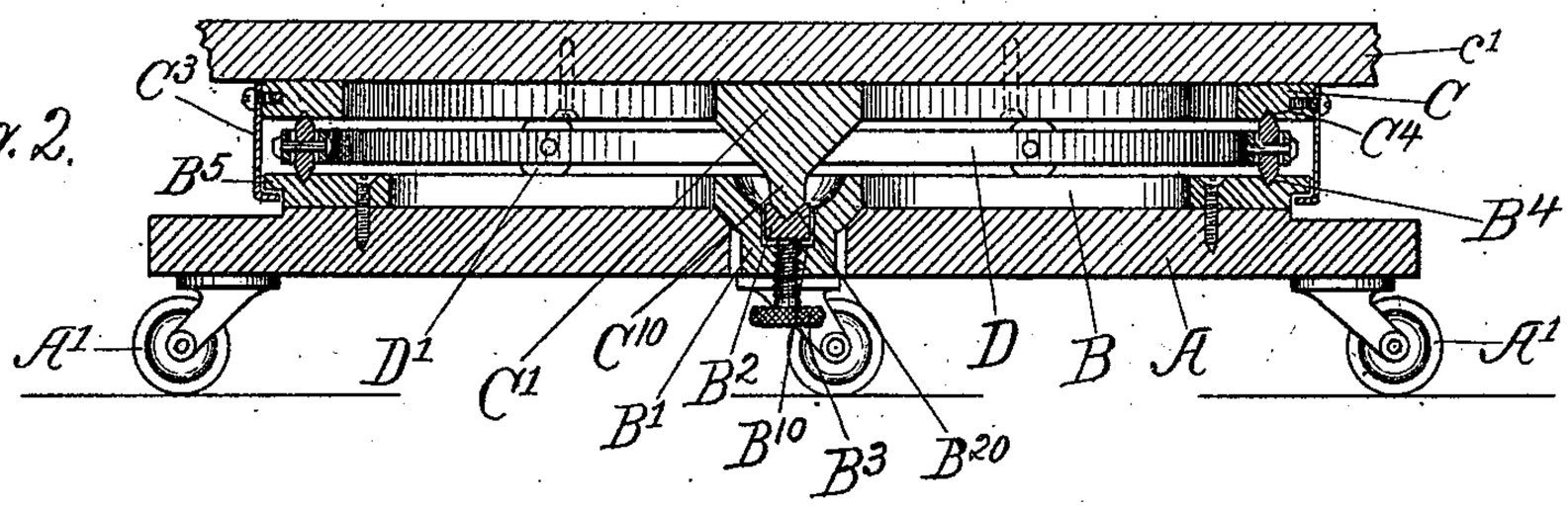



Fig. 3.

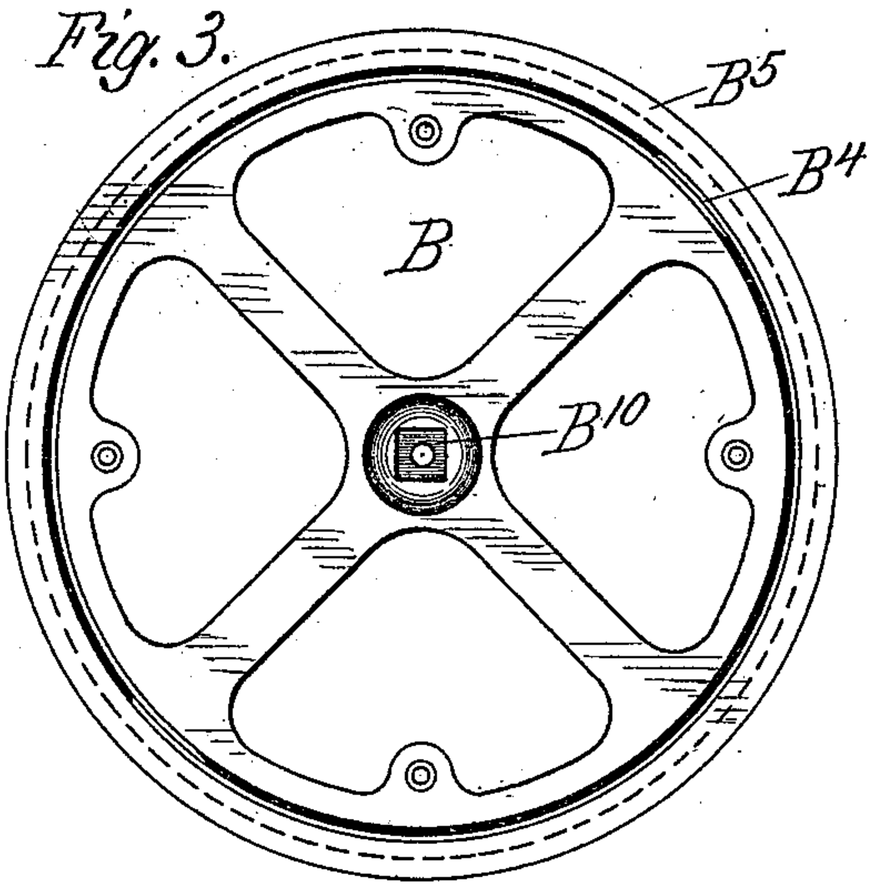



Fig. 4.

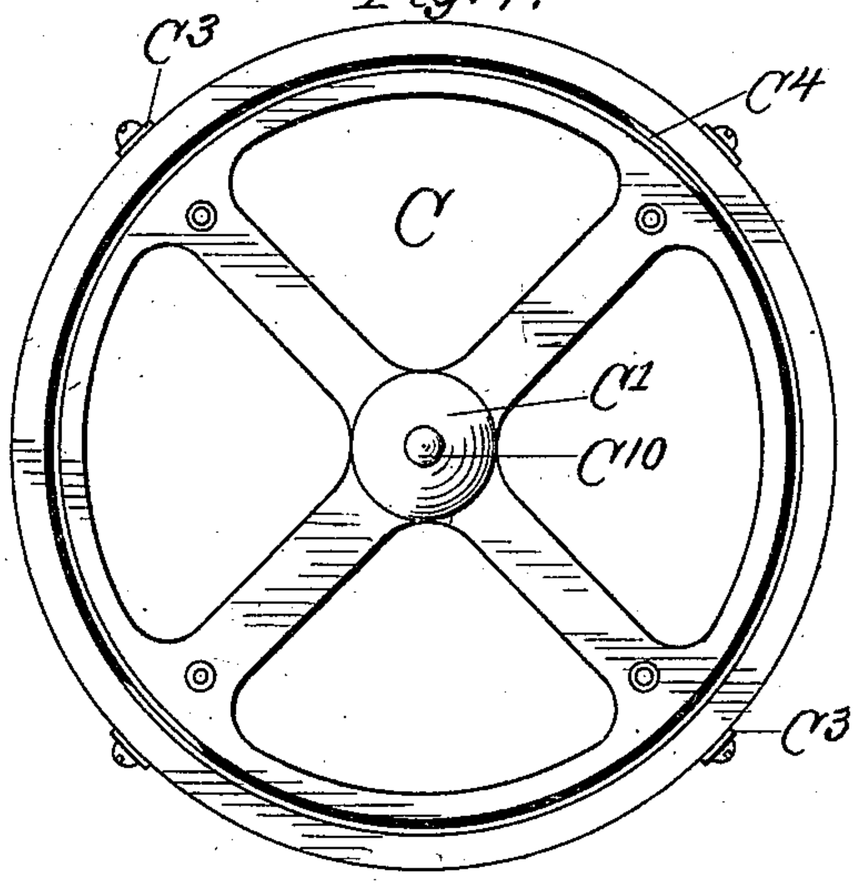



Fig. 6.

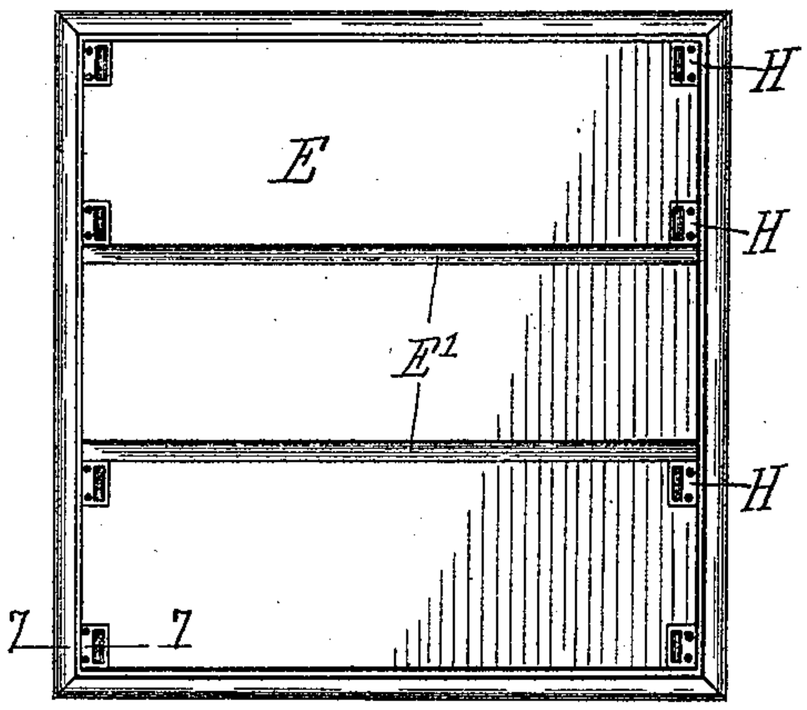
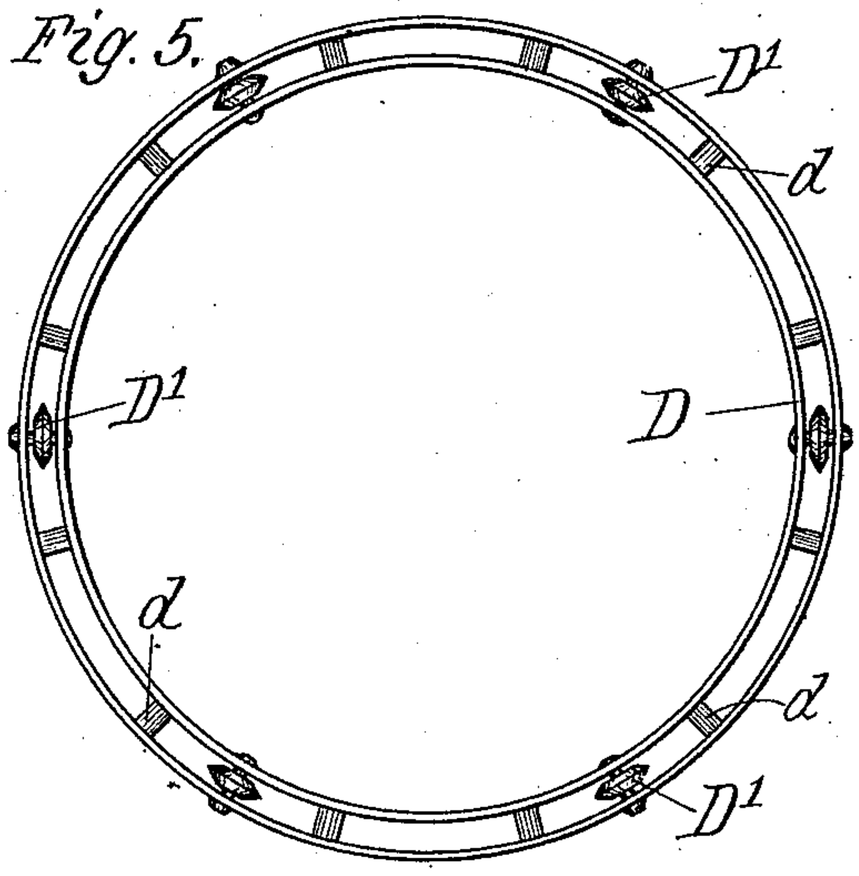



Fig. 5.

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(No Model.) 3 Sheets—Sheet 3.

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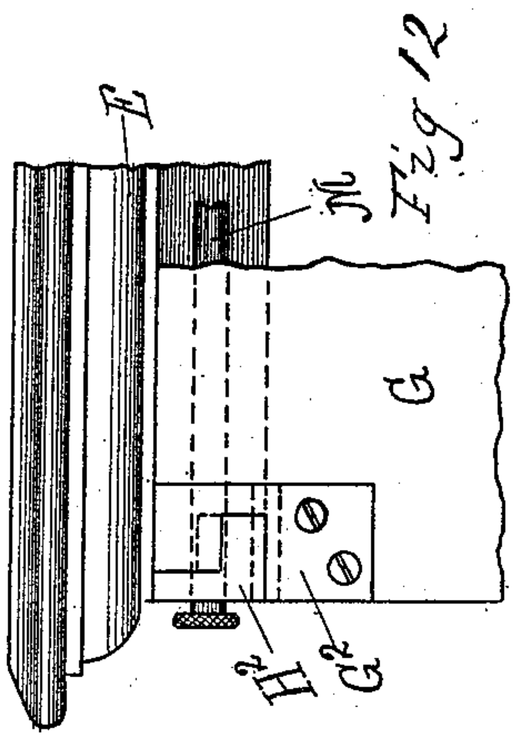


Fig. 12

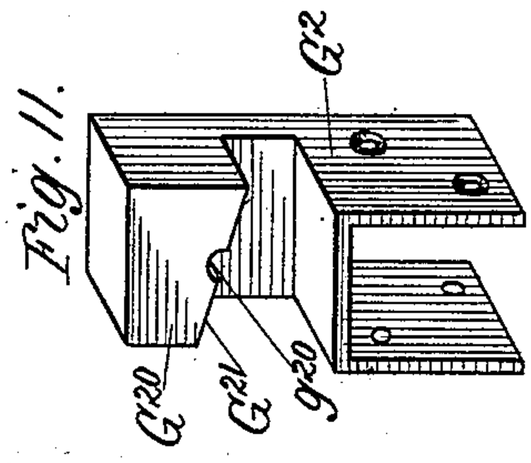


Fig. 11.

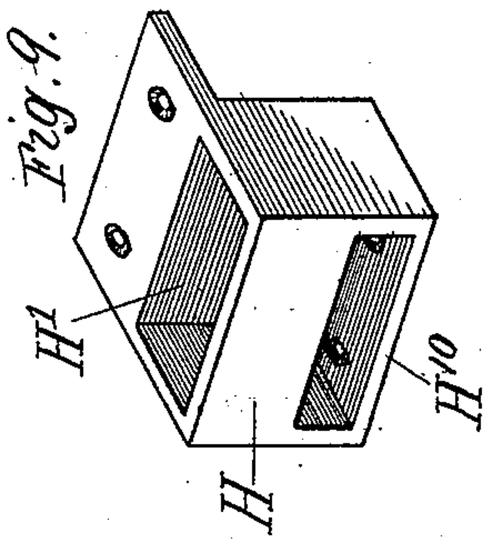


Fig. 9.

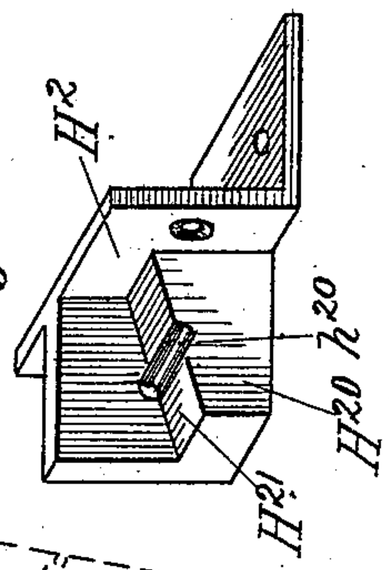


Fig. 10.

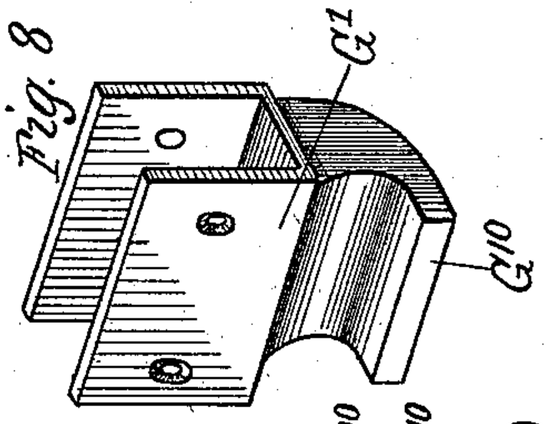


Fig. 8

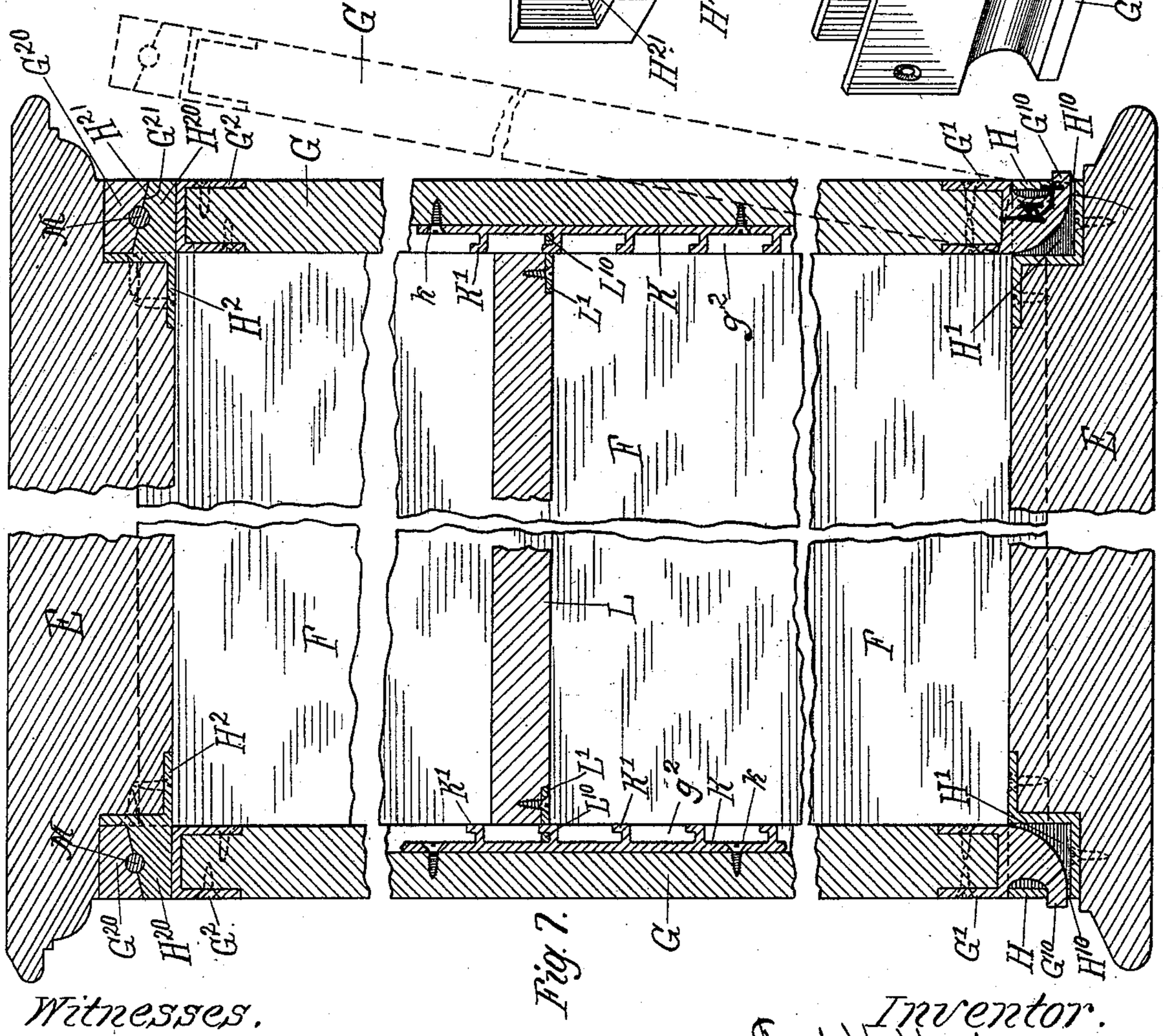


Fig. 7.

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# UNITED STATES PATENT OFFICE.

FRED H. HALEY, OF HAMILTON, ILLINOIS.

## REVOLVING CASE FOR BOOKS.

SPECIFICATION forming part of Letters Patent No. 497,657, dated May 16, 1893.

Application filed August 8, 1892. Serial No. 442,457. (No model.)

*To all whom it may concern:*

Be it known that I, FRED H. HALEY, a citizen of the United States, residing at Hamilton, county of Hancock, and State of Illinois, have invented certain new and useful Improvements in Revolving Cases, which are fully set forth in the following specification, reference being had to the accompanying drawings, forming a part thereof.

This invention relates to the construction of revolving cases employed for exhibiting or storing books or other articles, and it embodies features pertaining to the bearings in and upon which the case rotates, and also the construction of the case which adapts it to be put together without glue joints, whereby it is suited for shipment in a "knock down" condition, and adapted particularly to transportation for long distances and to points where the services of expert mechanics or finishers are not obtainable, since all the parts may be completely finished before shipment and assembled without disfigurement and without the necessity of skilled mechanical labor.

In the drawings, Figure 1 is a side elevation of my improved case, a portion of the marginal flange at the bottom being broken away to show the supporting mechanism in side elevation. Fig. 2 is a vertical axial section through the spindle bearing of the revolving base, the upper portion of the case being broken away, showing only the supporting devices. Fig. 3 is a top plan of a metal spider or frame which is mounted on the fixed base upon which the case revolves and which has the bearings for such rotary motion. Fig. 4 is a bottom or inverted plan of a spider or frame which is secured to the revolving case and has the central spindle by which the case is supported in the fixed base. Fig. 5 is a plan of an annular frame which has journaled in it the anti-friction rollers which intervene between the revolving case and the fixed base. Fig. 6 is a top plan of the base cap, or an inverted plan of the top cap of the case, the two caps being identical in all respects which would appear in such view. Fig. 7 is a detail vertical section through the case, as at the line 7—7 on Figs. 1 and 6, showing the devices by which the sides are secured to the caps and bind the latter together, and also the devices by which the shelves are held in place and at the same time assist in holding the sides in place. Fig. 8 is a perspective of a clip designed to be secured to the lower ends of the sides for the purpose of fastening the sides to the lower cap. Fig. 9 is a perspective of a clip designed to be secured to the lower cap to receive the clip shown in Fig. 8. Fig. 10 is a clip designed to be secured to the upper cap. Fig. 11 is a clip designed to be secured to the upper end of the side in order to co-operate with the clip shown in Fig. 10, for the purpose of fastening the upper end of the side to the upper cap. Fig. 12 is a detail side elevation of one of the upper corners of the case, showing the fastening of the sides to the top cap. Fig. 13 is a perspective of a metal shelf support which is let into the sides. Fig. 14 is an enlarged detail plan of a clip which is fastened to the shelves to co-operate with the shelf support shown in Fig. 13.

I will first describe so much of my invention as relates to the devices for supporting and permitting the rotation of the case upon the base.

A is a plank constituting a fixed base, which may be provided with customary casters A′.

B is a metal spider or frame which is fastened by screws to the upper side of the base plank A. At the center of the spider B, its hub B′ has the square socket $B^{10}$, in which rests the pivot block $B^2$, which has the conical seat $B^{20}$, adapted to receive the conical terminal of the spindle hereinafter described which pertains to the revolving case.

$B^3$ is a thumb screw, which is screwed up into the hub from the lower side at the center of the socket $B^{10}$, and is designed to adjust the pivot block $B^2$ in height for a purpose hereinafter explained.

$B^4$ is a groove in the upper face of the spider B, concentric with the conical socket in the pivot block $B^2$, which is designed to serve as a track for the anti-friction rollers hereinafter described.

C is a frame or spider which is secured to the under side of the plank *c′*, which directly supports the case, and might be the bottom cap thereof. This spider has at its center

the hub C′, terminating downwardly in a spindle $C^{10}$, whose conical point seats in the conical socket $B^{20}$ of the pivot block $B^2$. The length of the spindle $C^{10}$ is such that when the conical point is seated in the pivot block, the lower face of the spider C is separated from the upper face of the spider B a sufficient distance to admit between them the annular frame D, with its anti-friction rollers D′ D′, &c. These rollers find a track in the groove $B^4$ in the lower spider B, and a similar track in the similar groove $C^4$ in the lower face of the spider C, said tracks $C^4$ and $B^4$ facing each other.

The annular frame D comprises inner and outer rings connected by cross ties *d* at intervals in the circumference. Preferably, this annular frame is cast with the inner and outer rings and the cross-ties integral. The anti-friction rollers *d′* of any desired number are placed between the inner and outer rings in the intervals between the cross-ties *d*, inserted through them after they are in position and suitably secured. The lower spider B has a peripheral flange $B^5$, and to the upper spider C are secured a plurality of brackets $C^3$, which project downward past the flanges $B^5$, and are turned inward at their lower ends so that they engage underneath the flange and thereby prevent the upper spider from being lifted off the lower after it is suitably placed in position with the roller-bearing-frame intervening and the brackets properly adjusted and fastened.

When the parts are in position, as shown in Fig. 2, the thumb screw $B^3$ will be used to adjust the pivot block $B^2$ high enough so that said pivot block and the spindle which seats in it take between them substantially the entire weight of the case, but not high enough to absolutely prevent contact of the spider C with the rollers D′; that is to say, when the weight is carried at the center on the spindle and its bearing the adjustment may be made so accurate that the rollers will still feel the contact of the upper spider upon them, and they will operate to steady the case and prevent its tilting over the support at the center. Thus I obtain the ease of rotary movement which is due to the center spindle bearing and at the same time equal steadiness and accuracy of position as if the weight were supported at a distance from the center, as, for example, as if it were supported upon the rollers.

I am aware that it is not new to connect a rotary base to a fixed base by a center bolt and to interpose between them anti-friction rollers traveling in tracks concentric with such center bolt, and I do not claim broadly rollers in such relation to the fixed and rotary base.

The second part of my invention relates to the construction of the case mounted upon this base, the features of which are such as to adapt it to be taken apart and re-assembled and the parts secured without the use of glue, screws or nails, and so that none of the surfaces which are exposed when the case is fully assembled are liable to be marred in the process of assembling or detaching.

E E are the upper and lower caps respectively of the case. The uprights F F, which extend between them, in whatever form they are arranged, according to the arrangement of shelving or other facilities in the case, are set in grooves E′ in the caps. By means of the upright sides G, the upper and lower caps are bound together to prevent them from being separated by a movement longitudinal with respect to the uprights F, by which said uprights might be dislodged from the grooves in the caps. The devices which adapt the upright sides G to perform this function consist of terminal clips G′ at the lower ends of the sides, and clips H, secured to the base cap E. The terminal clips G′ are in any suitable manner arranged to be securely fastened to the ends of the sides G, and terminate each in a hook $G^{10}$. The clips H are similarly adapted to be secured to the edge of the base cap E, and have a socket H′, which the hook $G^{10}$ is adapted to enter from above, and an aperture $H^{10}$ into which the point of the hook is made to protrude by swinging the side G from an inclined position shown in dotted line in Fig. 7 toward the upright position which it will occupy when the case is completely assembled, as seen in full lines in said Fig. 7.

In order to secure the upper end of the side G to the upper cap E, a clip $G^2$ is provided, adapted to be secured to the upper end of the side G, and a corresponding clip $H^2$ is secured to the upper cap. These clips have similar tongues $H^{20}$ and $G^{20}$, projecting respectively horizontally and vertically, and in lateral proximity to each other when the case is assembled.

In order that the top and bottom caps may not only be held against vertical separation, but may be drawn and tightly bound together and onto the uprights by means of the sides G, the tongues $H^{20}$ of the clips $H^2$, which are fastened onto the top cap, are each provided with a lateral shoulder $H^{21}$, facing upward, which is inclined as shown in the drawings, being highest at the inner end, and the tongue $G^{20}$ of the clip has a similar shoulder $G^{21}$, facing downward, and corresponding in inclination to the upwardly facing shoulder $H^{21}$, so that as the side G is swung in toward its upright position against the cap, the sloping shoulders $G^{21}$ and $H^{21}$, engaging and sliding upon each other, tend to draw the cap tightly down onto the uprights, and by their engagement, without regard to their slope, prevent the top and bottom caps from being separated vertically.

I prefer to make the shelves or horizontal partitions of the case serve as a means of holding the sides G up against the upper cap in the position in which, by the engagement of the shoulders $G^{21}$ and $H^{21}$, they serve to

hold the caps onto the uprights. And I accomplish this purpose, besides other purposes which pertain to the adjustment of the shelves, by the following devices, comprising first, metal shelf supports K, which I prefer to cast integrally, comprising a base plate with angle hooks K′ projecting therefrom at intervals of an inch more or less throughout the length of the base. The sides G are grooved upon their inner surfaces, as at $g^2$, deep enough to receive the shelf support K, to the full depth of the hooks K′, so that said hooks do not project beyond the inner surfaces of said sides, as seen in Fig. 7. The shelf supports may be secured to the sides in the grooves by screws through holes $k$ at intervals in the length.

To the shelves L, at the ends, and, preferably, let into the under side, as seen in Fig. 7, I secure the clips L′, which have lugs $L^{10}$ projecting beyond the ends of the shelves L, adapted to enter the grooves $g^2$, and having the apertures $l^{10}$, adapted to receive the hooks K′ on the shelf supports. After the caps and uprights and sides are assembled as described, the shelves, provided with the clips L′, being introduced between the upright sides, may be hooked to the shelf supports at all desired positions, leaving any desired interval between consecutive shelves, and being thus engaged with the hooks on the shelf supports, prevent the spreading of the sides which might occur through warping or springing, and which would tend to permit the shelves to drop down if they were only supported in the customary, manner in grooves, and at the same time, this connection of the shelves to the shelf supports prevents the sides from swinging outward at their upper ends, and becoming disengaged from the top caps, and thereby the shelves,—or, particularly, the top shelf,—becomes a key to lock the sides G to the top cap. In addition to this expedient, and in order to render the case secure even during the temporary removal of the shelves or horizontal partitions, the tongues $G^{20}$ and $H^{20}$ of the clips $G^2$ and $H^2$ are provided with apertures $h^{20}$ and $g^{20}$, respectively, which coincide when the side G is brought to its upright position, and a key-bolt M is inserted horizontally through them, binding them together.

The clips $H^2$ and $G^2$ may be applied only at the corners of the side G, and at corresponding positions on the top cap E, but, if preferred, additional similar clips may be applied between the corner clips, the cap being cut away to admit the tongue of the clip $G^2$ alongside the tongue of the clip $H^2$, and the wood of the cap being bored through in the line of the apertures $g^{20}$ $h^{20}$, so that a single key bolt may be inserted across the whole width of the side G, and take through all the clips.

It will be obvious that the form of connection of sides and caps herein shown at the top and bottom respectively, may each be used in either position, and that the form shown at the top may be used at both ends, if preferred.

I claim—

1. In a case, in combination with horizontal and upright members making corner junctions, clips $H^2$ and $G^2$ adapted to be secured to said members respectively, and projecting from said members side by side and provided with oppositely facing shoulders $H^{21}$ and $G^{21}$ which engage each other, said clips having the apertures $h^{20}$ and $g^{20}$, and the locking pin adapted to be inserted through them: substantially as set forth.

2. In a case, in combination with horizontal and upright members making corner junctions, clips $H^2$ and $G^2$ adapted to be secured to said members respectively and projecting therefrom alongside of each other; such clips being provided with oppositely facing and correspondingly inclined shoulders $H^{21}$ and $G^{21}$, and having the transverse apertures $h^{20}$ and $g^{20}$, and the locking pin inserted through the same: substantially as set forth.

3. In a case, in combination with caps and the sides which connect them, the clips $H^2$ and $G^2$ secured to the caps and sides respectively and projecting therefrom alongside of each other and provided with oppositely facing shoulders which engage; the shelves extending transversely between the uprights, said shelves and uprights being provided with co-operating parts constituting hook connections, whereby the shelves hold the uprights from lateral separation and keep the shoulders of the clips in engagement: substantially as set forth.

4. In a case, in combination with the caps and partitions extending between them and holding them apart, the sides engaged at one end with one of the caps; the other cap and the other ends of said sides being provided respectively with the clips $H^{21}$ and $G^{21}$, having oppositely facing and correspondingly inclined shoulders, whereby the caps are drawn together and bound onto the ends of the partitions as the sides are forced home at their junctions with the caps: substantially as set forth.

5. In a case, in combination with the caps and partitions extending between them and holding them apart, the sides engaged at one end with one of the caps; the other cap and the other ends of said sides being provided respectively with the clips $H^{21}$ and $G^{21}$, having oppositely facing and correspondingly inclined shoulders, whereby the caps are drawn together and bound onto the ends of the partitions as the sides are forced home at their junctions with the caps; and the shelves or partitions extending transversely between the sides; said shelves and sides having co-operating fittings constituting hook connections whereby the shelves retain the sides in engagement with the caps: substantially as set forth.

6. A case comprising top and bottom caps and upright sides; two-part connections between one of the caps and the corresponding end of the sides, consisting of sockets adapted to be secured to the cap, and hooked clips adapted to be secured to the sides and to be engaged with said sockets by tilting or swinging the sides from an outwardly inclined to an upright position; and two-part connections for the opposite ends of the sides, consisting of a clip adapted to be secured to the cap and a clip adapted to be secured to the sides, having respectively horizontal and vertical projections adapted to extend side by side and provided with oppositely facing shoulders which engage when the side is upright: substantially as set forth.

7. In combination with the revolving base having a downwardly projecting spindle at its center, the fixed base having a socket affording a step-bearing for the end of the spindle, and anti-friction rollers on horizontal bearings interposed between the fixed and revolving bases and suitably retained in a circle about the axis of rotation in contact with both bases, at a horizontal plane near the horizontal plane of the step bearing at a distance remote from the vertical axis of the case whereby the revolving case is supported by the spindle in the step-bearing, and is steadied and leveled by the rollers remote from said bearing: substantially as set forth.

8. In a revolving case, in combination with a revolving base having a downwardly projecting spindle at its center, a fixed base and a pivot block at the center thereof having a step bearing for the end of the spindle; anti-friction rollers interposed between the two bases in the circumference of a circle about the axis of rotation; the fixed base being provided with an adjusting screw $B^3$ to force the pivot block upward, whereby said block may be adjusted to take the weight of the case practically off of the rollers: substantially as forth.

9. In combination with the revolving base having the downwardly projecting spindle and the fixed base having the vertically adjustable pivot block which affords a step-bearing for the end of the spindle, said bases having annular grooves facing each other and anti-friction rollers traveling in such grooves; one of the bases having a marginal flange and the other base having brackets provided with horizontally projecting terminals adapted to engage the flange: substantially as set forth.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, at Memphis, Missouri, this 7th day of June, 1892.

FRED H. HALEY.

Witnesses:
E. H. BALDWIN,
SILAS SPRINGSTREE.