(No Model.) 2 Sheets—Sheet 1.

F. C. VAN DOREN, Dec'd.

C. A. COVERT, Administrator.

REVOLVING SHELF.

No. 425,354. Patented Apr. 8, 1890.

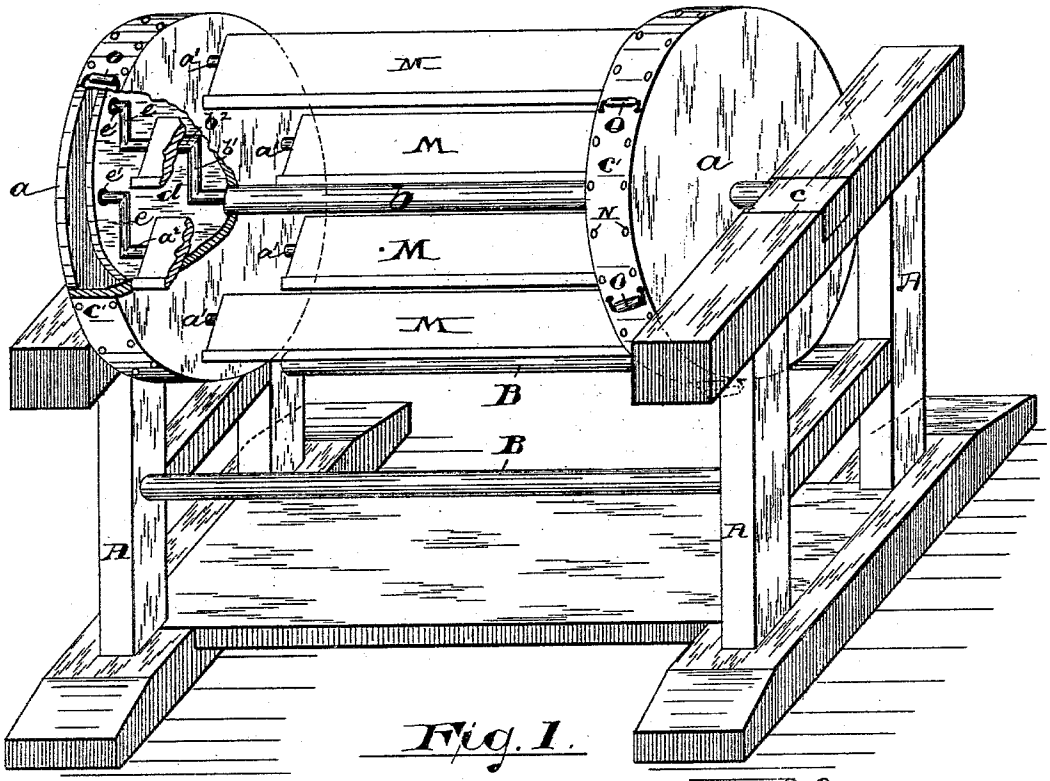

Fig. 1.

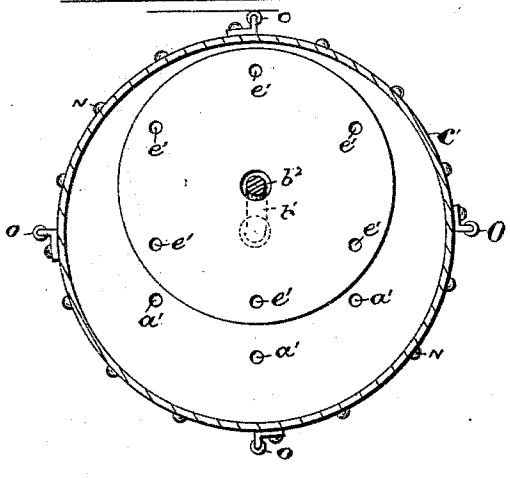

Fig. 2.

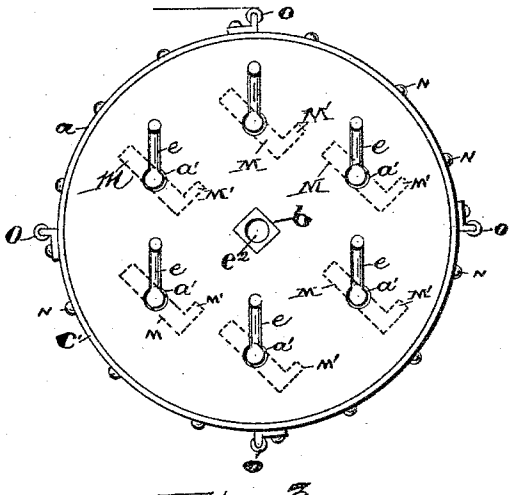

Fig. 3.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) F. C. VAN DOREN, Dec'd. 2 Sheets—Sheet 2.

C. A. COVERT, Administrator.

REVOLVING SHELF.

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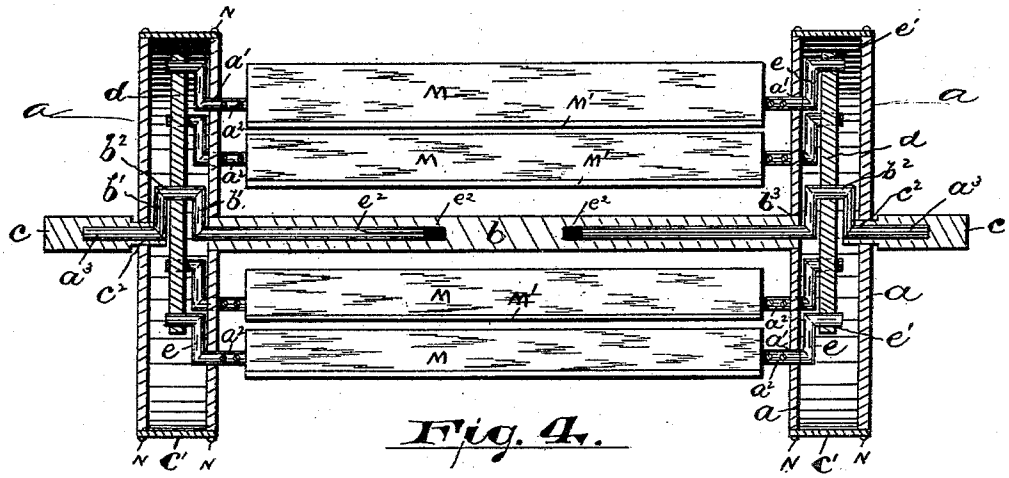

Fig. 4.

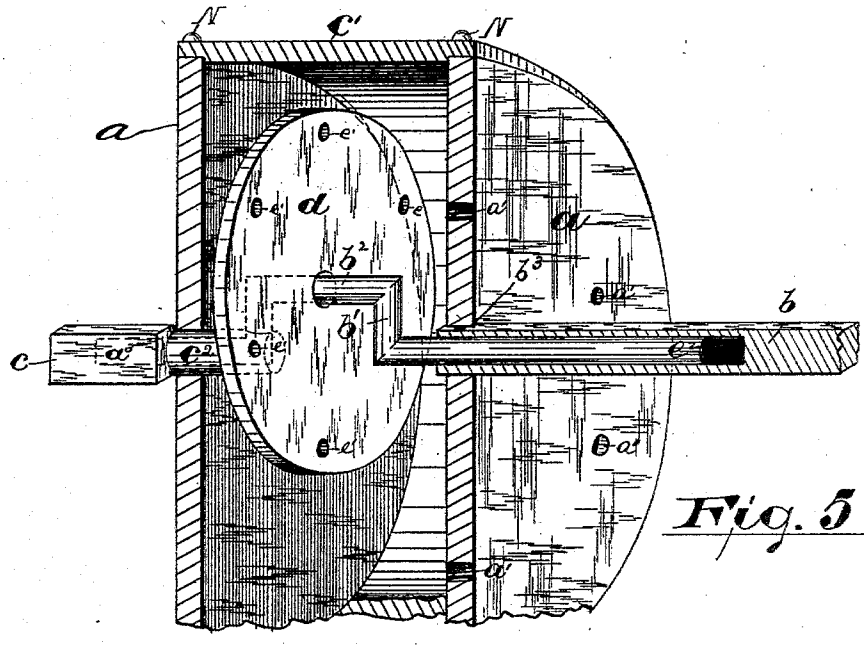

Fig. 5

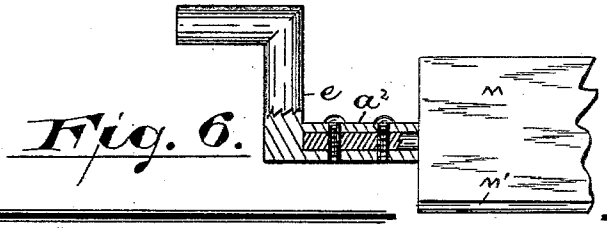

Fig. 6.

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UNITED STATES PATENT OFFICE.

FREDERICK C. VAN DOREN, OF NEWARK, NEW JERSEY; CHARLES A. COVERT ADMINISTRATOR OF SAID VAN DOREN, DECEASED.

REVOLVING SHELF.

SPECIFICATION forming part of Letters Patent No. 425,354, dated April 8, 1890.

Application filed December 10, 1888. Serial No. 293,112. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK C. VAN DOREN, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Revolving Shelves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of my invention is to secure a perfect and uniform adjustment of any number of shelves at any angle in a frame or between supports, and to retain them in position when adjusted, so that articles placed thereon cannot fall or slide off when the shelves are revolving or at rest.

The invention consists in the peculiar arrangement and adjustment of shafts, wheels, and yokes operating in combination with connecting-cranks, for the purpose and as shall be hereinafter set forth, and finally embodied in the clauses of the claim.

The accompanying drawings illustrate my mechanism, in which like letters of reference indicate corresponding parts in each of the several figures.

Figure 1 is a perspective view of the system of revolving shelves with portions broken away. Fig. 2 is a sectional view of the left-hand drum through line x, Fig. 4. Fig. 3 is an end view of the inner side of one of the inside drum-casings. Fig. 4 is a central longitudinal sectional view of my device without the supporting-frame extending clear across the system. Fig. 5 is an enlarged perspective view of one of the inner wheels, showing its bearing on the yokes and pivotal openings for one end of the shelf-connecting cranks, also showing the adjustment of the yokes and their relation to the shafts and the bearings of inner and outer drum-casings. Fig. 6 is an enlarged view of one of the shelf-connections, showing connecting-crank with end of shelf journaled into the same, a portion of the crank being broken away.

In the drawings, A A represent a supporting-frame braced by lateral rods or bars B. (Seen underneath the drums in Fig. 1.) This supporting-frame is not limited to any one style of construction. It can be made stationary or movable on the floor, or built overhead. The only end to be attained is a firm support in which to rigidly secure the short shafts c, which project at either side of the drums a a. (Shown more clearly in Fig. 4.) The short shafts c c extend through the outer drum-casings a a only, being square on the end projecting outside the casing and round on the inner end, as shown in Fig. 5, to serve as a bearing on which revolve the outer drum-casings, as at c^2, Fig. 5. Through the inner ends of shafts c c are inserted the outer ends of yokes b' b', as seen at a^3, Figs. 4 and 5, and firmly secured into said shafts c c, holding said yokes stationary in the position shown in the drawings, with the upright portion of the yokes in a fixed perpendicular position, bearing the cross-piece b^2 directly on a line with the center of the drums, but raised above it, as clearly shown in Figs. 4 and 5.

On the cross-piece b^2 of yokes b' are arranged wheels d, which revolve on said cross-piece b^2, and thus have a motion axially different from that of the drums a a. (Shown more clearly in Fig. 5.) The size of this wheel d is always regulated by the size of the inner drum-casings a a—namely, the diameter of the circle described by the openings in wheels d at e' must be the same as the diameter of the circle described by the openings at a' in the inner drum-casings a a, the openings in each being also the same distance apart and the same distance from each of their respective centers.

Extending between the shelves M M centrally is shaft b, passing through the inner sides of drums a a only, and said sides being rigidly secured to it, (shown clearly at b^3, Figs. 4 and 5,) thus causing shaft b and inner drum-casing a to revolve together. The ends of shaft b are made hollow part way or clear through, as at e^2 e^2, Figs. 4 and 5. Into this shaft b is inserted loosely the inner ends of yokes b' b' part way or clear through the shaft, (clearly shown in Figs. 4 and 5,) thus allowing shaft b, together with inner drum-casings a a, to revolve easily on the inner ends of yokes b' b', while the outer ends of yokes b' b' are firmly secured in short shafts c, which

rest rigidly in a supporting-frame, with outer drum-casings *a a* revolving on said short shafts *c*, the yokes *b' b'* being always stationary, with the vertical portion bearing cross-piece b^2 in a fixed perpendicular position, with wheel *d* revolving on said cross-piece b^2, all of which is clearly shown in Fig. 5.

In the inner sides of drum-casings *a a* are openings *a' a'*, (seen more clearly in Figs. 2 and 3,) through which pass the shelf-connections, as shown at a^2 a^2, Fig. 4, arranged and adapted to move freely in said openings at *a'*. The shelf-connections consist in a series of right-angled connecting-cranks *e e*, (seen more clearly in Figs. 3 and 4,) the upper ends being pivoted in openings in wheel *d* and moving freely therein, as at *e' e'*, Figs. 4 and 5, and the other or lower end passing through the openings in inner drum-casings at *a' a'* and rigidly secured to shelves M M. (Shown clearly in Figs. 4 and 6.) The shelf-connections can be made by journaling the ends of shelves M M in the ends of connecting-cranks *e e* and firmly screwing them together, as shown in Figs. 1, 4, and 6; or a shelf-piece with one end fitting around the ends of shelves M M by means of a shoe or shoulder and the other end telescoped into connecting-crank *e*, and both screwed together, can be used. The shelves M are provided with flanges M' M' to prevent articles from sliding off. The shelves M can be adjusted and secured at any angle desired, and any number employed by increasing the size of drums *a a* and wheels *d*, apportioning the distances apart and allowing for the increased shelf-connections, as will be manifest from the drawings. N N are screws or nails to secure the edge-covering *c' c'* of drums *a a* to the edges of drums, thus completely inclosing the mechanism within the drums.

O O are handles for conveniently turning the drums to bring any shelf to any desired position.

A spring-lock can be secured to the supporting-frame, operating against the drums to stop their revolution at any point. In constructing the device the length of the vertical portion of connecting-cranks *e e* and the length of the vertical portion of yokes *b' b'* must be the same, measuring between centers. In operating the device, when the drums *a a* are turned around in either direction, the shelves M M are carried down and up, but are prevented from being turned themselves by reason of their being rigidly connected to one end of the connecting-cranks *e e*, as at a^2, Figs. 3 and 4. These cranks *e e*, being adapted at their upper ends to work pivotally in the openings at *e' e'* in the inner wheel *d*, carry along with them in their motion this wheel *d*, while at the same time, being rigidly connected at their lower ends with shelves M M, and by reason of the vertical position of yokes *b' b'* maintaining the wheel *d* on the cross-piece b^2 of said yokes above the center of drums *a a*, but directly on the same line, the cranks *e e* are continually maintained in a fixed vertical position, as shown in Figs. 3 and 4, thus keeping the shelves M M always in the position at which they are adjusted to the connecting-cranks *e e*.

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

1. In a revolving shelf, the combination of a frame, a shaft mounted in said frame having a crank at or near each end, disks on said cranks having a series of openings therein, drums fixed on the shaft having openings in one side thereof, and shelves having cranks at each end which pass through the openings of the drum and engage those of the disks.

2. In a revolving shelf, the combination of the drums, the short socketed shafts connected to the outer sides of the drums, the long socketed shafts connected to the inner sides of the drums, the shafts having cranks engaging and secured in the sockets of said shafts, the disks on said cranks, and the shelves having cranks which pass through the drums and engage the disks, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 3d day of December, 1888.

FREDERICK C. VAN DOREN.

Witnesses:
OLIVER DRAKE,
E. L. SHERMAN.