Nov. 13, 1928. 1,691,186

A. GRETH

CABINET

Filed Jan. 22, 1923

Fig. 1.

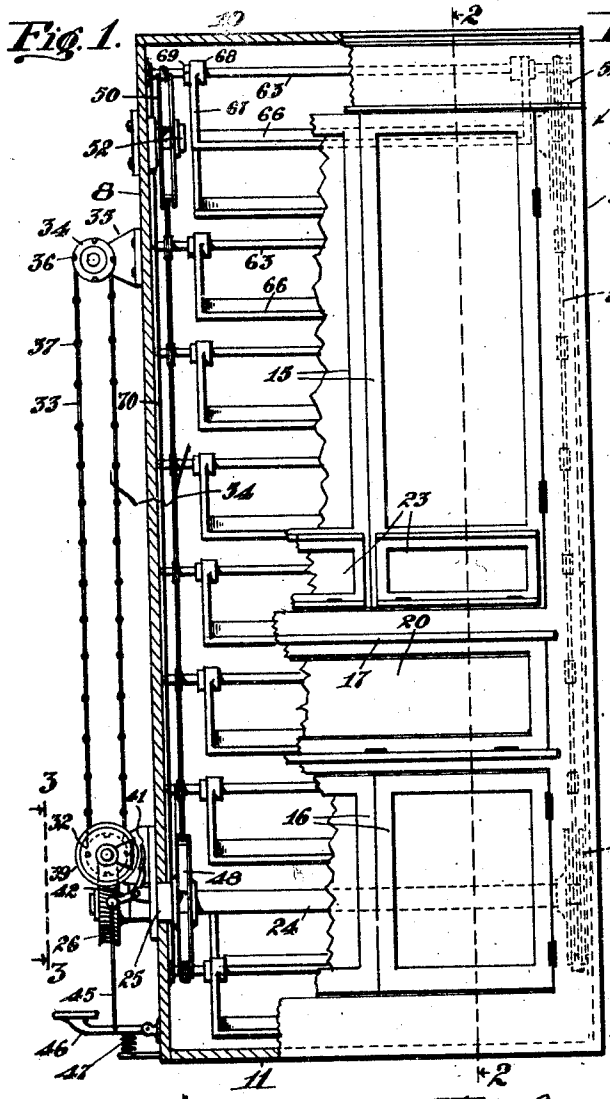


Fig. 2.

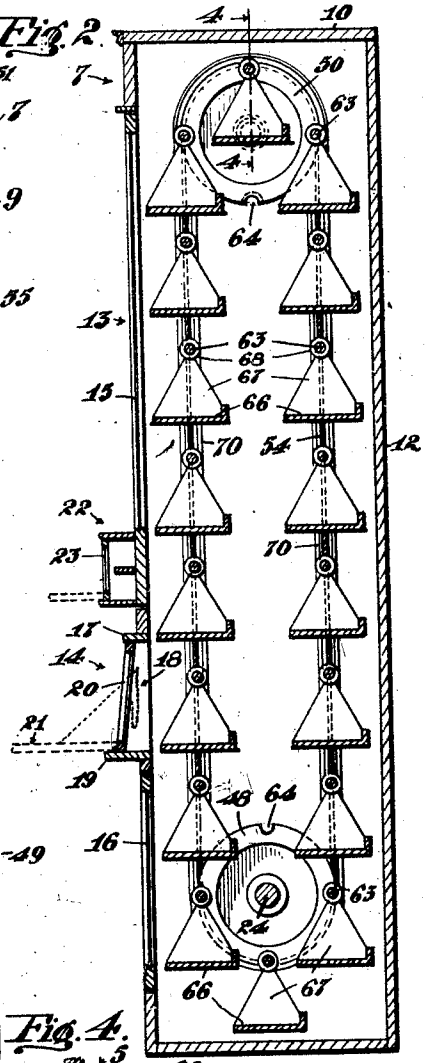


Fig. 3.

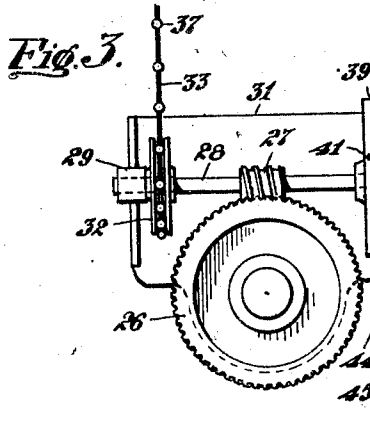


Fig. 4.

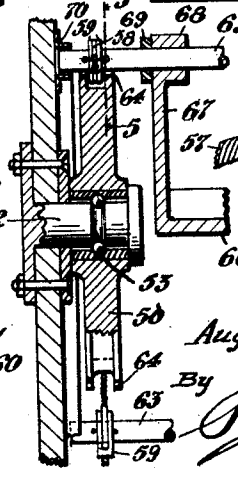


Fig. 5.

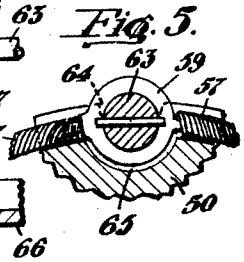
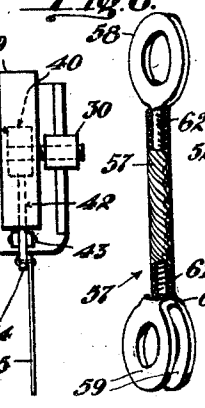


Fig. 6.



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Patented Nov. 13, 1928. 1,691,186

UNITED STATES PATENT OFFICE.

AUGUST GRETH, OF LOS ANGELES, CALIFORNIA.

CABINET.

Application filed January 22, 1923. Serial No. 614,112.

My invention particularly pertains to a cabinet of the type embodying a series of shelves mounted on endless carriers and adapted on operation of the carriers to be moved so that the several shelves may be successively positioned at various horizontal planes.

An object of my invention is to provide a cabinet of the above character which is particularly adapted for containing books and similar articles by means of which shelves carrying the books or articles may be easily and quickly moved to bring them within easy reach, whereby the cabinet may be constructed of considerable height and whereby the necessity and inconvenience incident to gaining access to contents of shelves that ordinarily would be difficult to reach, is obviated.

A further object is to provide a simple and effective mechanism whereby the shelves may be readily raised and lowered.

Another object is to provide a substantial supporting means for traveling shelves and also to provide a construction in the endless carriers whereby the latter may be readily assembled and sections thereof easily removed and replaced in event of breakage or wear.

A further object is to provide a construction whereby the carrier will be held against rotation in event of unequal loads being carried on the opposite vertical lines of the carrier.

With the foregoing objects in view, together with such other objects and advantages as may subsequently appear, my invention resides in the parts and in the construction, arrangement and combination of parts hereinafter described and claimed and illustrated in the accompanying drawings, in which—

Figure 1 is a view of a cabinet as seen in front elevation, portions broken away to show the interior of the cabinet.

Figure 2 is a view in vertical section as seen on the line 2—2 of Figure 1 in the direction indicated by the arrows.

Figure 3 is an enlarged detail in elevation as seen on the line 3—3 of Figure 1 in the direction indicated by the arrows, showing the carrier-actuating mechanism.

Figure 4 is a detail in section as seen on the line 4—4 of Figure 2, showing the manner of supporting the shelves on the carrier and illustrating the manner of supporting the upper portion of the carrier.

Figure 5 is an enlarged detail in section as seen on the line 5—5 of Figure 4, showing the manner of forming the carrier and interconnecting it with a pulley and with a shelf support.

Figure 6 is a perspective view of a carrier-link section.

More specifically, 7 indicates a cabinet which may be of any suitable construction and is here shown as embodying side walls 8 and 9, top and bottom walls 10 and 11, a back wall 12, and a front portion 13, which front portion includes a desk portion 14, and hinged doors 15 located above the desk portion, and also hinged doors 16 located below the desk portion, through which doors access may be readily had to the interior of the cabinet.

The desk portion 14 embodies a frame 17 surrounding an opening 18 extending transversely across the cabinet, the lower member of the frame comprising an outwardly projecting shelf 19 to which is hinged a vertical swinging door 20 adapted when disposed upwardly to extend over and form a closure for the opening 18, and also adapted when in its lowered or open position to form a shelf or desk as indicated at 21 in dotted lines in Figure 2.

Mounted on the doors 15 are cabinets 22 fitted with closures 23, the cabinets 22 being carried by the doors 15 to swing therewith. Extending horizontally across the lower portion of the cabinet is a rotatable shaft 24 supported at its ends in suitable bearings carried on the side panels 8 and 9; the bearing in the panel 8 indicated at 25 being tubular and projecting through the side panel 8. The outer end portion of the shaft 24 projects through the bearing 25 and has a worm wheel 26 rigidly mounted thereon, and meshing with the wheel 26 is a worm 27 on a shaft 28 rotatably mounted in bearings 29 and 30 carried on a plate 31 supported on the outer face of the side panel 10.

As a means for rotating the shaft 28, the latter is fitted with a grooved pulley 32 around which passes an endless cable 33, the upper portion of which fastens around an idler grooved pulley 34 revolubly carried on a bracket 35 secured to the panel 8; the pulley 34 being spaced above the pulley 32. The grooved pulleys 32 and 34 are formed with peripheral recesses 36 and the cable 33 is provided with suitable protuberances 37, here shown as spherical in form, which are engageable with the recesses 36 so that on movement of the cable in either direction a rotary mo-

tion will be imparted to the pulley 32 and shaft 28 so as to effect rotation of the wheel 26 and the drive shaft 24. A balance wheel 39 is mounted on the shaft 28 so as to give momentum to the latter when it is set in motion, and effect continued rotation of the shaft 28 and the parts operated thereby after the pull on the cable 33 has been discontinued.

As a means for retarding movement of the shaft 28 and the parts operated thereby, a brake 40 is provided which brake embodies a shoe 41 carried on the upwardly extending arm of a vertically disposed bell crank lever 42 pivoted at 43 and having a horizontally extending arm 44 connected by a rod 45 to a foot lever 46 in such manner that depression of the foot lever will throw the brake into operative engagement with the periphery of the balance wheel 39. A spring 47 acts to normally maintain the foot lever 46 in an uppermost position and serves to hold the brake shoe 41 normally out of engagement with the balance wheel.

Mounted on the shaft 24 interiorly of the cabinet is a pair of groved pulleys 48 and 49 which are located adjacent the inner faces of the side panels 8 and 9, respectively. A corresponding pair of pulleys 50 and 51 are arranged adjacent the top of the cabinet and are carried on stub shafts 52 suitably mounted on the side panels, there being anti-friction bearings 53, here shown as balls, interposed between the pulley wheels 50 and 51 and their respective stub shafts to facilitate rotation of the pulleys 50 and 51 under the load carried thereby.

Passing around the pulleys 48 and 50 is an endless carrier 54, and passing around the pulleys 49 and 51 is a corresponding carrier 55 indicated in dotted lines in Figure 1. Each of these carriers is formed with a series of link sections 56, particularly shown in Figure 6, which link sections embody a flexible central portion 57 preferably formed of woven wire cable one end of which is fitted with a ring 58 and the other end of which carries a pair of spaced rings 59. The rings 59 are connected together by a cross member 60 to form a yoke, which cross member is provided with a stem 61 to which the member 57 is affixed, as by brazing or welding. The ring 58 is provided with a stem 62 to which the other end of the member 57 is attached.

In assembling the carrier to form an endless chain of the links 57, the ring 58 on one link is inserted betwen the rings 59 on the adjacent link, and is preferably pivotally connected thereto so that the adjacent links may have articulate movement relative to each other. In the construction here shown I employ shelf-supporting rods 63 carried by the carriers 54 and 55 as the means for connecting the adjacent links; the end portions of the rods being passed through the rings, which rings may be held against longitudinal movement on the rods in any desired manner, they being however preferably turnable on the rods. By this construction a flexible connection is provided between adjacent rods and an articulate joint is formed between adjacent links, and the links also pivot on the rods, which construction permits ready adaptation of the endless carriers to the pulley wheels around which they are passed.

The peripheral flanges on the pulleys 48 and 50 are formed with cutaway portions 64 to receive the end portions of the rods 63 whereby on rotation of the driving pulleys 48 and 49, rotation of the carriers 54 and 55 will be effected. The bottom wall of the peripheral channel on the pulleys is formed with recesses 65 adjacent the cutaway portion 64, which recesses receive the rings of the links.

Mounted on each of the rods 63 is a dependent shelf 66 which shelf is preferably pivoted on the rods, and for which purpose is secured at each of its ends to the lower portion of a hanger 67 the upper portion of which is formed with a sleeve 68 which encircles and is turnable on the shaft 63.

Collars 69 on the shaft 63 hold the shelves against longitudinal movement on the latter.

As a means for holding the vertical leads on the endless carriers against swinging, guideways 70 carried by the side panels 8 and 9 are provided, into which the ends of the carrier rods 63 extend.

The operation of the invention is apparent from the foregoing, it being seen that on movement of the cable 33 in either direction, as by exerting a manual pull thereon, the shaft 28, carrying the worm 27 and the fly wheel 39 will be set in motion; the fly wheel acting in the usual manner after motion has been imparted thereto, to set up kinetic energy and effect continued rotation of the shaft 28 after the pull on the cable 33 has been discontinued. Rotation of the worm 27 revolves worm wheel 26 and shaft 24 which causes the pulleys 48 and 49 to rotate and drive the endless carriers 54 and 55 by reason of the engagement of the ends of the rods 63 in the cutaway portion 64 on the peripheries of the pulleys 48 and 49. The carriers will thus be operated to move one lead thereof in an upward direction while the other lead descends, and in carrying the dependent shelves therewith, will cause the shelves to move successively to a horizontal plane opposite the opening 18 in the cabinet. When it is desired to bring a shelf to rest adjacent the opening 18, assuming the momentum being sufficient to carry the shelf past the opening, the brake 40 is applied to retard the movement of the fly wheel 39 and shaft 28 and to bring them to a stop. By the provision of the operating means as here described, any one of the plurality of shelves may be readily brought to a desired position so as to give easy access to the contents of a shelf.

By providing a cabinet as here shown, nearly double the amount of shelf space may be provided in a cabinet of given height than is possible in the ordinary cabinet having a single stack of shelves, taking into consideration the spacing of the shelves from one another, and accordingly a large capacity is afforded in a compact space coupled with convenience of access.

By providing the worm drive and the control here shown, the carrier may be very easily moved, that is to say, the application of little power to the cable 33 will effect movement of a considerable load supported by the carrier. Furthermore, the worm 27 intermeshing with the worm wheel 26 serves to prevent rotation of the latter through power applied to the shaft 24, thus preventing movement of the carrier in event the load sustained by one line of the carrier should exceed that carried by the other. The shelves will normally remain stationary until movement is imparted thereto by action of the worm 27 as before described.

While I have shown and described a specific embodiment of my invention, I do not limit myself to the exact details of construction and the arrangement shown, but may employ such modifications and changes as come within the scope of the appended claim.

I claim:—

In a cabinet of the character described, a plurality of individually flexible links, each link having a ring at each of its ends, the rings of each link overlapping rings of adjacent links, a plurality of rods extending through the rings thus forming a chain of said links, a pair of spaced sheaves having peripheral notches adapted to receive said rods, supporting said chain, and a carrier suspended from each of said rods.

AUGUST GRETH.