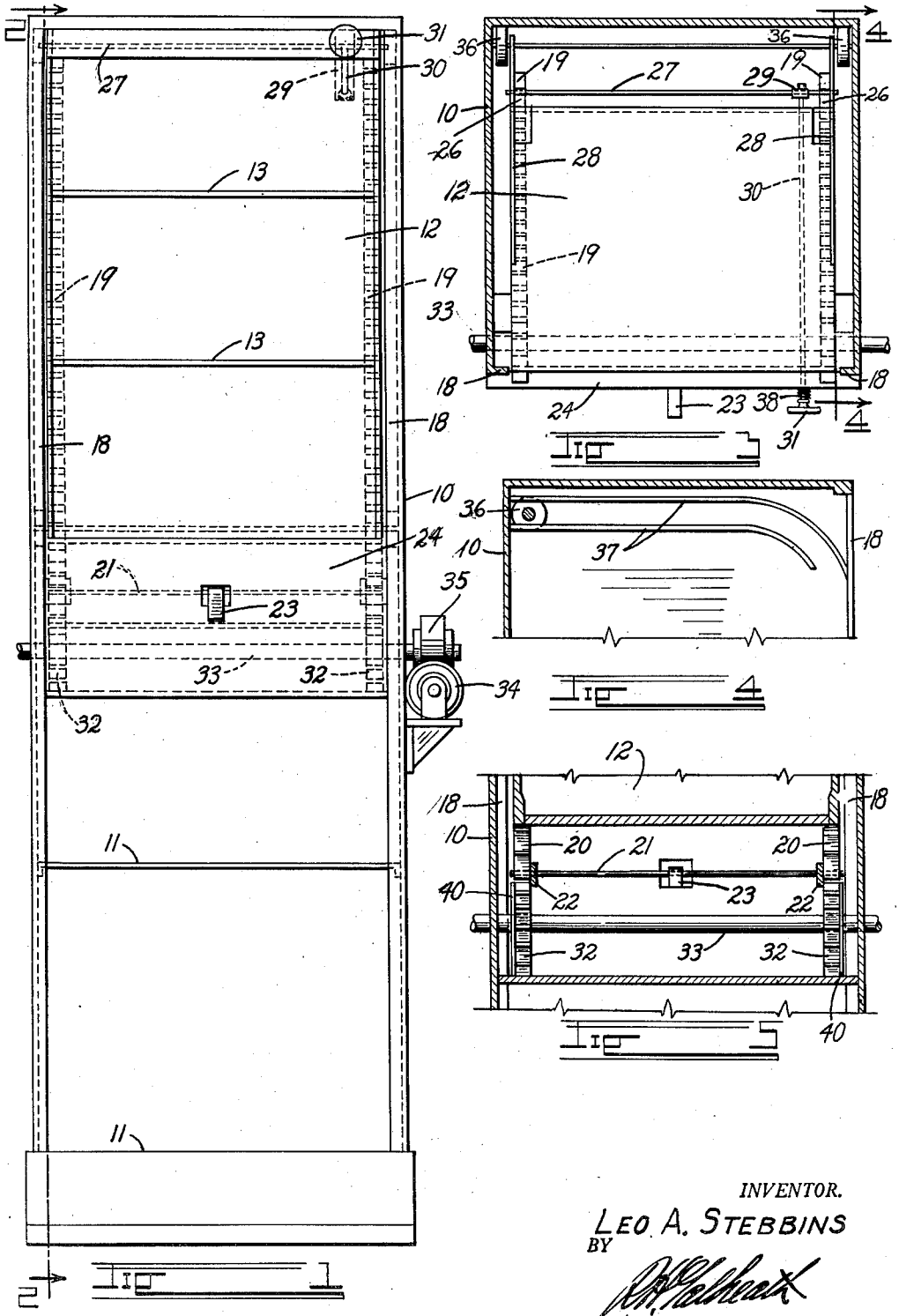
May 29, 1951 L. A. STEBBINS 2,555,254

SELF-LOWERING CABINET

Filed Aug. 25, 1947 2 Sheets-Sheet 1



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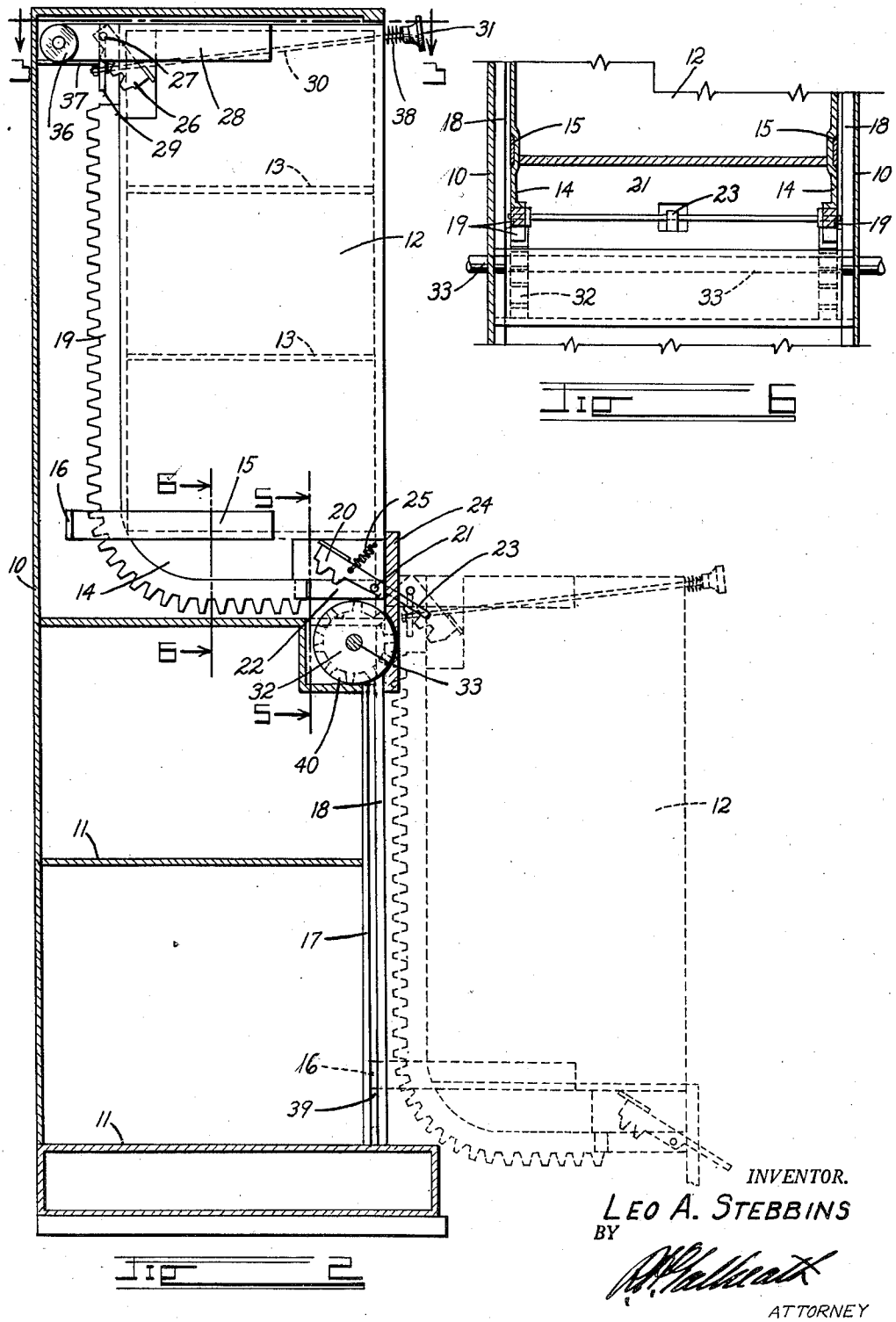


FIG. 6

FIG. 2

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SELF-LOWERING CABINET

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4 Claims. (Cl. 312—319)

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This invention relates to what might be termed a "let-down" cabinet. The upper spaces of a room are usually useless for cabinet purposes, due to the difficulty in reaching the upper shelves. Traveling ladders and other devices have been designed for this purpose, but these present difficulties in space waste, etc.

The principal object of this invention is to provide a cabinet which may be constructed to any desired height, and in which the upper sections, which are difficult to reach, may be lowered to convenient reaching height and lifted to place by means of a motor-operated mechanism.

Another object of the invention is to so construct the device that it will have a minimum of working parts; so that a single motor can be employed to operate a plurality of independently controlled cabinets; and so that the device will operate under exceedingly heavy loads in the cabinets.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention, reference is had to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

Fig. 1 is a front view of a cabinet in which the invention is embodied;

Fig. 2 is a vertical section therethrough, taken on the line 2—2, Fig. 1;

Fig. 3 is a horizontal section, taken on the line 3—3, Fig. 2; and

Fig. 4 is a detail section taken on the line 4—4, Fig. 3; and

Figs. 5 and 6 are detail sections taken on the lines 5—5, and 6—6, respectively, Fig. 2.

The invention comprises a vertically arranged cabinet 10 having a lower shelf portion 11 and an upper, movable shelf box 12. The movable shelf box 12 comprises two sides joined by means of a top and bottom. The section 12 is closed at its back with suitable intermediate shelving 13. The sides of the box 12 extend downwardly below the bottom thereof and curve upwardly as the back is approached, to provide downwardly extending runner-like projections 14 on the bottom of the section 12.

A continuous toothed rack 19 is attached to the bottom of each projection 14 and extends rearwardly along the arcuate bottom edges thereof

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and upwardly along the back of the section 12. The forward extremities of the racks 19 terminate in lower hinged rack sections 20 which, when swung into alignment with the racks 19, form a continuation of the teeth thereof.

The rack sections 20 are fixedly mounted on a hinge shaft 21 carried by forwardly extending bracket arms 22 secured to the forward extremities of the racks 19. The shaft 21 is rotated in a counter-clockwise direction, to align the sections 20 with the racks 19, by means of an operating lever 23 which extends through an apron 24 on the upper section 12. The shaft 21 is rotated in the opposite direction by means of a return spring 25. The upper extremities of the two racks 19 terminate in upper hinged rack sections 26 which are fixedly mounted on a hinge shaft 27 supported across the upper rear of the box 12 in two side roller arms 28. An operating lever 29 extends downward from the shaft 27. A push rod 30 extends forwardly from the lever 29 to a thumb button 31 on the front of the shelf box 12. A spring 38 surrounds the rod 30 behind the button 31 to constantly urge the rack sections 26 out of alignment with the racks 19. They may be brought into alignment by pressure on the button 31.

The teeth of the racks 19 and the rack sections 20 and 26 are designed to engage the teeth of pinion gears 32. The gears 32 are fixedly mounted on a gear shaft 33 extending between the sides of the cabinet 10 at the forward face thereof immediately below the shelf box 12.

The shaft 33 may be rotated from a suitable electric motor 34 through the medium of a conventional speed reducer 35.

There may be a plurality of the cabinets 10 positioned side-by-side in horizontal alignment, in which case, the shaft 33 could extend through all of the cabinets and carry a pair of gears 32 within each cabinet. Each cabinet would be a duplicate of the one illustrated.

Each side roller arm 28 is provided with a guide roller 36. The guide rollers 36 travel between forwardly and downwardly curved guide tracks 37 secured to the sides of the cabinet 10. The guide tracks 37 terminate against vertical stop flanges 18 which extend inwardly from each side of the cabinet 10 for the full height thereof. The upper shelf box is also provided with stops 15 which extend rearwardly from adjacent the bottom of the box 12 and terminate in outwardly extending guide hooks 16 which, when the box 12 moves forward, contact the stop flanges 18 and move downward in a guide track 41.

Let us assume that the shaft 33 is rotating clockwise in Fig. 2, and that it is desired to lower the upper shelf box 12. The operator pushes upwardly on the operating lever 23. This swings the lower rack sections 20 into engagement with the rotating teeth of the gears 32 causing the gears to travel into the racks 19 to pull the upper section 12 forwardly, the rollers 36 traveling in the guides 37.

As the upwardly curved portions of the racks 19 travel over the gears 32, the section 12 will gradually lower until it is completely forward of the cabinet 10. The vertical portions of the racks 19 will now travel downwardly over the gears 32, lowering the upper portion 12 to the dotted line position in Fig. 2.

The box 12 is prevented from tilting forwardly by the vertical stop flanges 18 which project inwardly from the two sides of the cabinet 10, and against which the rollers 36 travel during the downward movement. The lower portion of the upper section 12 is prevented from swinging inwardly by means of the guide hooks 16 which slide downwardly between the flanges 18 and the guide track 17.

When the upper section reaches its lowermost position, it comes to rest against stop members 39. In this position the rack sections 26 are opposite the gears 32 which are swung forwardly by the spring 38 so that the sections 26 will not contact the gears. Thus the shaft 33 may continue to rotate without further movement of the upper section 12.

When it is desired to elevate the box 12, the motor 27 is reversed to cause the shaft 26 to rotate in a counter-clockwise direction in Fig. 2. The operating rod 30 is then pushed inwardly. This causes the upper swinging rack sections 26 to engage the rising teeth of the gears 32. This immediately elevates the box 12 until the gear teeth can engage the teeth of the racks 19. The thumb button is then released and the box returns to the solid line position of Fig. 2.

The gears 32 are preferably of the shrouded type, that is, they are provided with circular side plates 40 which act to guide the racks in alignment with the gear teeth.

While a specific form of the improvement has been described and illustrated herein, it is desired to be understood that the same may be varied within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:

1. A self-lowering cabinet comprising: a vertically arranged cabinet having two side walls; an upper shelf box adapted to fit between the side walls at the upper portion of said cabinet; a pair of toothed racks extending forwardly beneath the bottom of said shelf box; a rotating shaft extending across said cabinet beneath said box and forwardly of the forward extremities of said racks; a gear wheel mounted on said shaft in front of each rack; and a hinged rack section carried by said box over each gear wheel so that it may be brought into alignment with said rack and into mesh with the teeth of said gears to cause the racks to move forwardly into mesh with said gears.

2. A self-lowering cabinet comprising: a vertically arranged cabinet having two side walls; an upper shelf box adapted to fit between the side walls at the upper portion of said cabinet; a pair of toothed racks extending downwardly on the back of said box and forwardly beneath the bottom thereof; a rotating shaft extending across said cabinet beneath said box and forwardly of the forward extremities of said racks; a gear wheel mounted on said shaft in front of each rack; a hinged rack section carried by said box over each gear wheel so that it may be brought into alignment with said rack and into mesh with the teeth of said gears to cause the racks to move forwardly into mesh with said gears to a position in front of said cabinet, thence downwardly; means maintaining said racks in mesh with said gears as the former move downwardly over the latter; a second pair of hinged rack sections, there being one rack section hinged to align with the upper extremity of each rack; and means for swinging said second pair of said rack sections into mesh with said gears to cause the latter to lift said box and travel into the teeth of said racks.

3. A self-lowering cabinet construction comprising: a vertical, stationary cabinet having two side walls and an open front; a movable shelf box adapted to be positioned between said side walls; a horizontal shaft extending between the side walls adjacent the open face and below the movable shelf box; means for rotating said shaft in either direction; a toothed gear carried by said shaft adjacent each side wall; a toothed rack extending rearwardly beneath the bottom, said racks terminating rearwardly of said gears; and swinging toothed rack sections arranged to temporarily act as a continuation of said racks over said gears.

4. A self-lowering cabinet construction comprising: a vertical, stationary cabinet having two side walls and an open front; a movable shelf box adapted to be positioned between said side walls; a horizontal shaft extending between the side walls adjacent the open face and below the movable shelf box; means for rotating said shaft in either direction; a toothed gear carried by said shaft adjacent each side wall; a toothed rack extending rearwardly beneath the bottom and upwardly along the back of said shelf box, said racks terminating rearwardly of said gears; swinging toothed rack sections arranged to temporarily act as a continuation of said racks over said gears, there being one of said swinging rack sections at each extremity of each toothed rack; guide rollers carried by said shelf section; guide tracks on said side walls for guiding said guide rollers forwardly as said racks travel forwardly over said gears; and means for maintaining said racks in mesh with said gears as the former move downwardly over the latter.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
552,441	Matthews	Dec. 31, 1895
714,206	Lipincott	Nov. 25, 1902
2,003,302	Miller et al.	June 4, 1935
2,202,158	Lidseen	May 28, 1940
2,295,405	Johnson et al.	Sept. 8, 1942