

L. DAY.
ANTI-LOST MOTION DEVICE FOR PULL-OUT SHELVES.
APPLICATION FILED MAY 3, 1906.

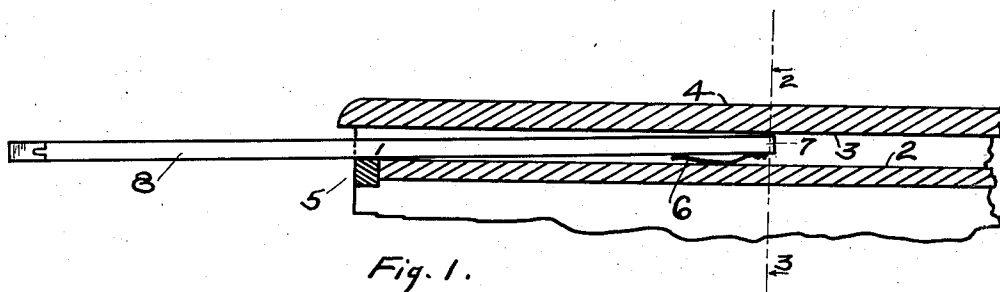


Fig. 1.

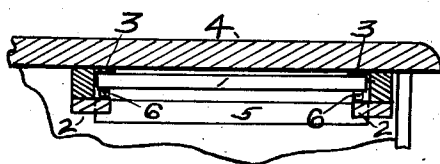


Fig. 2.

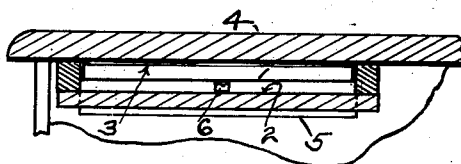


Fig. 3.

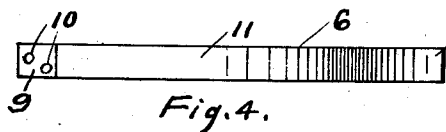


Fig. 4.

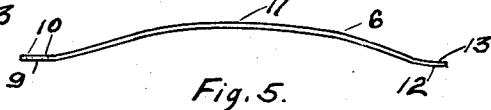


Fig. 5.

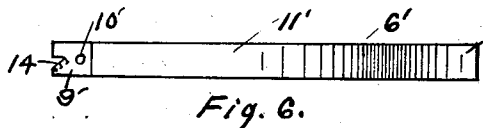


Fig. 6.

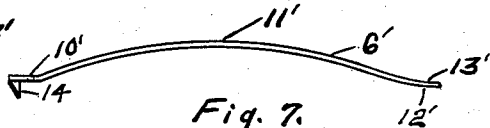


Fig. 7.

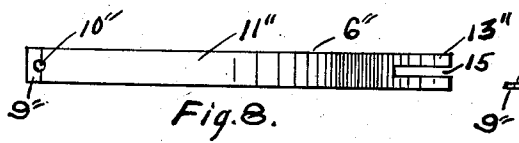


Fig. 8.

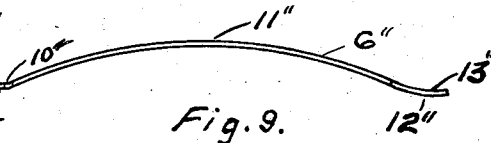


Fig. 9.

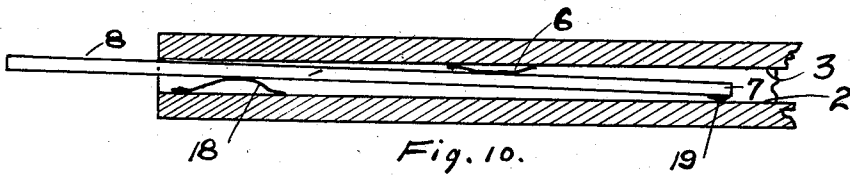


Fig. 10.

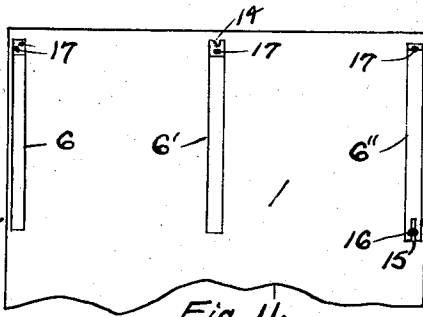


Fig. 11.

WITNESSES:

as seen
Wm. E. Allen

INVENTOR

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LEONARD DAY, OF NEW YORK, N. Y.

ANTI-LOST-MOTION DEVICE FOR PULL-OUT SHELVES.

No. 857,271.

Specification of Letters Patent.

Patented June 18, 1907.

Application filed May 3, 1906. Serial No. 315,112.

To all whom it may concern:

Be it known that I, LEONARD DAY, a citizen of the United States, and a resident of the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Anti-Lost-Motion Devices for Pull-Out Shelves, of which the following is a specification.

This invention relates to pull-out extension shelves. This type of shelf is customarily guided and restrained between two sets of spaced parallel ways between which it has a longitudinal sliding movement so that one end which normally projects from between the guiding and restraining ways may be pulled out or pushed in so as to vary the extent of the shelf extension. This type of shelf is frequently employed as an adjunct to office desks and is usually located directly under the desk top and may be pulled out to form a self supporting extension shelf at the elbow of one seated at the desk. To insure the satisfactory operation of these pull-out extension shelves under varied climatic conditions which effect the material of which they are made it has been found necessary to space apart the oppositely located guiding and restraining ways an amount in excess of the thickness of the sliding shelf to be retained between them. Otherwise a shelf would be quite apt to bind or at least offer considerable resistance when being pulled out, if the weather conditions were bad. This spacing apart of the ways in excess of the shelf's thickness normally gives rise to a considerable degree of play of the shelf between its ways. If the ways are arranged at top and bottom of the shelf, then the shelf, when pushed in rests upon the bottom way or ways entirely out of contact with the top way or ways. This condition is normally maintained even when the shelf is pulled out so that its extension is almost half its total length or less. The moment a weight is applied to the shelf extension the inner end of the shelf flies up until it strikes the top way or ways and is thereby restrained. This movement of the inner end of the shelf is purposeless and is nothing but lost motion, occasioning a needless and troublesome rattle every time pressure is applied to or withdrawn from the top of the shelf extension. Not until the shelf is withdrawn more than half its total length does its own weight lift its inner end into contact with the top way or ways.

An object of this invention is to provide means which will maintain the inner end of a pull-out extension shelf, which is restrained between spaced top and bottom ways, in sliding contact with said top way or ways while the bottom face of said shelf may be in sliding contact with the bottom way or ways at a locality near the extending portion of the shelf. Further objects are to provide for an easy sliding noiseless extension shelf.

In as much as there was formerly useless and troublesome lost motion at the inner end of a pull-out shelf or slide which was restrained merely between spaced ways, which were not necessarily top and bottom ways and which therefore did not necessarily maintain the shelf in a horizontal position, it follows that a further object of this invention is to provide means which will be operable to cause the inner and outer ends of the portion of a shelf between said spaced ways respectively to engage ways oppositely located relatively to said shelf, which means shall be operable throughout the sliding movement of the shelf.

More in detail, an object of this invention is to provide spring means, which can be made with convenience and despatch and which may readily be combined with a pull-out extension shelf to further the desired objects above enumerated.

What is considered to be a preferred embodiment of this invention is illustrated in the following drawings in which like reference numerals designate corresponding parts and in which

Figure 1 is a sectional elevation of the upper portion of a desk and illustrating the invention. Figs. 2 and 3 are similar to Fig. 1, but represent sections taken along planes at right angles to that of Fig. 1 and approximately through line 2—3 of Fig. 1. Figs. 4, 6 and 8 are detail plan views illustrating various modifications of applicant's spring means. Figs. 5, 7 and 9 are detail side elevations of the modifications illustrated respectively in Figs. 4, 6 and 8. Fig. 10 is a sectional view showing oppositely located spaced ways and an extension slide restrained between them, together with spring means applied in a modified manner from that illustrated in Fig. 1. Fig. 11 is a bottom plan view of an extension shelf, such as is illustrated in Figs. 1, 2 and 3, provided with one each of the spring means illustrated in Figs. 4 to 9 inclusive.

Referring now more particularly to the drawings, 1 designates a pull-out extension shelf slidably restrained between two or more substantially parallel, spaced ways 2 and 3.

In Figs. 1, 2 and 3, 4 designates a desk top, the lower face of which forms a top way 3 for the extension shelf 1 illustrated in Figs. 1 and 3. In Fig. 2 there are illustrated two top ways 3, for the shelf 1, which extend lengthwise of the shelf substantially parallel with the bottom ways 2. Fig. 2 also illustrates two bottom ways which are designated by the numeral 2, while Fig. 3 illustrates but a single bottom way 2 for the shelf, since in this figure, the two bottom ways illustrated in Fig. 2 which are located merely along the side edges of the shelf 1, are in the form of a single piece of material bridged from one side edge of the shelf 1 to the other. 5 designates a cross-bar which extends transversely to the shelf 1 and with its upper surface substantially flush with the bottom ways 2. 6 designates spring means interposed between the inner end 7 of the shelf 1 and one or more of the bottom ways 2. This spring means is of any suitable form, but is preferably of a form such as is illustrated in Figs. 4 to 9 inclusive.

In Figs. 1, 2, 3 and 11, a spring means 6 is shown as secured to the bottom face of the shelf 1 in position slidably to engage the bottom way or ways and to move back and forth with the shelf 1 as the extent of the shelf extension or extending portion 8 is varied, which may be done at will by pulling out the shelf or pushing it in. The spring means 6 serves to lift up the inner end 7 of the shelf and bring it into sliding contact with the top way or ways 3, while at the same time, gravity maintains the portion of the shelf between the ways 2 and 3 and, near to the extending end 8 in sliding contact with the bottom way or ways 2 or with the cross-bar 5 which also serves, as shown in Fig. 1, as a bottom way. As a result, even though the extension 8 form but a small portion of the whole shelf's extent, which is the case when the shelf 1 is almost pushed in, this extension 8 is always ready to receive a weight on its upper surface, as for instance the elbow of one seated at the desk, without there being lost motion at the inner end 7. This end 7 is already held in light sliding contact with upper way or ways 3 which serve as stops when a weight is put on the extension 8 and prevent the further tilting of the shelf. Furthermore this spring strip 6 rather aids than hinders the sliding movement of the shelf 1. When one moves the shelf it is natural slightly to raise the forward end, in which case the weight on the spring 6 is increased to approximately one half that of the whole shelf. This spring means 6 may be proportioned so that when the weight upon it in-

creases to this amount, the inner end 7 will just escape contact with the top way or ways 3 and this spring means will act as an anti friction runner for the shelf. All this action is automatic so that nothing but the satisfactory results are made known to the operator or user of a shelf provided with this invention. The precise form given to the spring means 6 is subject to modification as also is the manner of combining it with a shelf.

Figs. 4 and 5 illustrate a spring means 6 comprising a bowed strip preferably of spring metal such as tempered steel. One end of this strip is provided with a flat attaching foot 9 with two perforations 10 to receive tacks. At 11 at the central portion of the convex part of the bowed strip the material is smoothed to form an anti friction sliding surface. A similar surface is also provided at 12 on the opposite side of the strip and at the end 13 opposite to the foot 9. This end 13 is slightly turned up as indicated.

Figs. 6 and 7 illustrate a spring means comprising parts indicated by primed numerals similar to those in Figs. 4 and 5 and indicated by the same numerals unprimed. However, a spur 14 is shown as taking the place of one tack hole 10. This spur 14 is designed to bite into the material to which the spring is fixed and to cooperate with a tack in the hole 10' to prevent turning of the spring 6'.

The modified spring 6'' shown in Figs. 8 and 9 comprises parts 10'', 11'', 12'' and 13'' similar to parts 10, 11, 12 and 13 of Figs. 4 and 5 and in addition thereto is provided with a guideslot 15 in the end 13'' to receive a guiding tack 16, as shown in Fig. 11. The attaching foot 9'', instead of being flat, is cradled or convexed at its bottom to form a rocking surface for the spring. The tack 17 shown in Fig. 11 which extends through the hole 10'' is not driven home so as rigidly to clamp the foot 9'' to the shelf or way, but acts like a hinge pin.

Each of the modifications just described has its peculiar advantages among which may be enumerated, simplicity for 6; simplicity and ease of attachment for 6'; and uniform flexibility for 6''.

Although Figs. 1, 2 and 3 show the ways 2 and 3 as top and bottom ways respectively, the invention is applicable to ways differently located, as for instance, if 2 were a top way and 3 a bottom way or even if both 2 and 3 were arranged in vertical planes. In some of its applications, it might be expedient to apply spring means at several localities and on opposite faces of the shelf 1 as shown by 6 and 18 in Fig. 10. It is also advantageous in some cases to provide a separate anti friction runner 19 between the shelf and a way.

Fig. 11 illustrates how a shelf 1 may be provided with spring strips 6, 6' and 6'' to

which they are attached by tacks or other suitable means 17. It is to be understood that this figure is for purposes of illustration merely, as a shelf might be provided with strips all of a kind or various desired combinations and in any desired number. * The mode of attachment to a way is the same as that shown in Fig. 11 as applied to a shelf.

Although there has been illustrated and described what is considered to be the preferred embodiment of this invention, it is to be borne in mind that the same is capable of many modifications and varied applications without departing from the true scope of the invention. For instance, other means than springs might accomplish the function of the means 6 and 18, although springs are preferred.

What is claimed and desired to be secured by Letters Patent is:—

1. Automatic means to co-operate with a pull-out extension shelf sliding between two or more substantially parallel, spaced ways which guide and restrain said shelf, said means operable to cause the inner and outer ends of the portion of said shelf between said ways respectively to engage ways located on opposite sides of said sliding shelf, and said means operable throughout the sliding movement of said shelf, so as to prevent lost motion at said inner end and to produce a silent extension shelf.

2. Automatic means, operable throughout the sliding movement of a pull-out extension shelf sliding between substantially parallel, spaced ways, for maintaining the inner end of said shelf in sliding engagement with one of said ways while the portion of said shelf near the exposed end thereof is normally maintained in sliding engagement with an oppositely located way, so as to prevent lost motion at the inner end of said shelf and to produce a silent extension shelf.

3. Automatic spring means operable upon a pull-out extension shelf, sliding between upper and lower substantially flat and parallel ways, but with one end extending therefrom, said means to maintain the inner end of said shelf in sliding contact with said upper way throughout the sliding movement of said shelf, while the portion of said shelf near the said extending end is normally held by gravity in sliding contact with said lower way, said means for preventing lost motion at the inner end of said shelf and to produce a silent extension shelf.

4. Automatic spring means comprising, a bowed spring strip, provided at its convex middle portion and at the opposite side of one end with smooth sliding surfaces and at its opposite end with a perforated attaching foot, said spring means operable upon a pull-out extension shelf, sliding between upper and lower substantially flat and parallel ways, but with one end extending therefrom,

said means to maintain the inner end of said shelf in sliding contact with said upper way throughout the sliding movement of said shelf, while the portion of said shelf near the said extending end is normally held by gravity in sliding contact with said lower way, said means for preventing lost motion at the inner end of said shelf and to produce a silent extension shelf.

5. Automatic means, operable throughout the sliding movement of a pull-out extension shelf sliding between substantially parallel, spaced ways, for maintaining the inner end of said shelf in sliding engagement with one of said ways while the portion of said shelf near the exposed end thereof is normally maintained in sliding engagement with an oppositely located way, so as to prevent lost motion at the inner end of said shelf and to produce a silent extension shelf, said means comprising an elongated bowed spring strip, provided at its convex middle portion and on the opposite side near one end with smooth sliding surfaces, said strip also provided at its opposite end with a flat attaching foot, said foot provided with one or more perforations.

6. Automatic means, operable throughout the sliding movement of a pull-out extension shelf sliding between substantially parallel, spaced ways, for maintaining the inner end of said shelf in sliding engagement with one of said ways while the portion of said shelf near the exposed end thereof is normally maintained in sliding engagement with an oppositely located way, so as to prevent lost motion at the inner end of said shelf and to produce a silent extension shelf, and an antifriction runner for the inner end of said shelf.

7. In combination with a pull-out extension shelf; two or more spaced substantially parallel flat ways for guiding and restraining said shelf; the inner end of said shelf slidably retained between said ways; the other end of said shelf projecting from between said ways and forming an extending portion of variable extent; and automatic means, operative throughout the sliding movement of said shelf, for maintaining said inner end and said extending portion of said shelf respectively in sliding engagement with oppositely located ways, so as to prevent lost motion at said inner end and to produce a silent extension shelf.

8. In combination with a pull-out extension shelf; two or more spaced substantially parallel flat ways for guiding and restraining said shelf; the inner end of said shelf slidably retained between said ways; the other end of said shelf projecting from between said ways and forming an extending portion of variable extent; and one or more springs operative throughout the sliding movement of said shelf, for maintaining said inner end and said extending portion of said shelf re-

spectively in sliding engagement with oppositely located ways, so as to prevent lost motion at said inner end and to produce a silent extension shelf.

5 9. In combination with a pull-out extension shelf; two or more spaced substantially parallel flat ways for guiding and restraining said shelf; the inner end of said shelf slidably retained between said ways; the other end
10 of said shelf projecting from between said ways and forming an extending portion of variable extent; and one or more springs attached to and sliding with said shelf, operative throughout the sliding movement of
15 said shelf for maintaining said inner end and said extending portion of said shelf respectively in sliding engagement with oppositely located ways, so as to prevent lost motion at said inner end and to produce a silent extension
20 shelf.

10. In combination with a pull-out extension shelf; one or more flat ways extending lengthwise along the top of said shelf; one or
25 more flat ways extending lengthwise along the bottom of said shelf; one or more sliding springs each interposed between the bottom of said shelf, near its inner end, and a flat way extending along the bottom of said shelf, for the purpose of elevating said inner end and
30 preventing lost motion of said inner end when said extension shelf is pressed down from above where it extends from between said top and bottom ways.

11. In combination with a pull-out extension shelf; one or more flat ways extending
35 lengthwise along the top of said shelf; one or more flat ways extending lengthwise along the bottom of said shelf; a sliding spring interposed between the bottom of said shelf,

near its inner end, and each flat way extending
40 along the bottom of said shelf, for the purpose of elevating said inner end and preventing lost motion of said inner end when said extension shelf is pressed down from above where it extends from between said
45 top and bottom ways.

12. In combination with a pull-out extension shelf; one or more flat ways extending lengthwise along the top of said shelf; one or
50 more flat ways extending lengthwise along the bottom of said shelf; a sliding spring interposed between the bottom of said shelf, near its inner end and each flat way extending along the bottom of said shelf, each spring
55 being secured to said shelf in position slidably to engage the underlying way, for the purpose of elevating said inner end and preventing lost motion of said inner end when said extension shelf is pressed down from above where it extends from between said top and bottom
60 ways.

13. In combination with a pull-out extension slide; a plurality of spaced ways located respectively on opposite sides of said slide and adapted to guide and restrain the same;
65 means for maintaining the inner end of said slide in sliding engagement with one of said ways; and means for maintaining a way on the opposite side of said slide in sliding contact with said slide near the extension portion
70 of the same.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

LEONARD DAY.

Witnesses:

C. A. HELFER,
IDA GILMORE.