Jan. 23, 1962 M. M. CHECK 3,017,655

DRAWER CONTROL

Filed Dec. 7, 1959

Fig. 1.

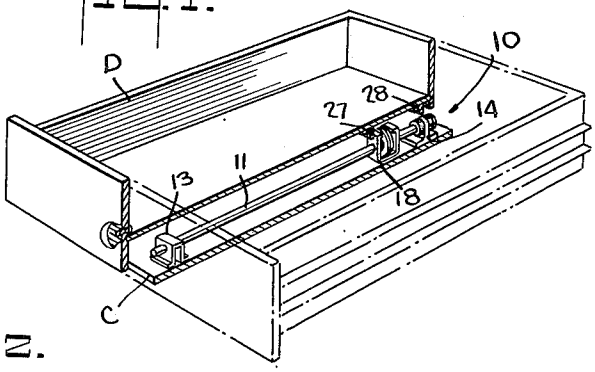


Fig. 2.

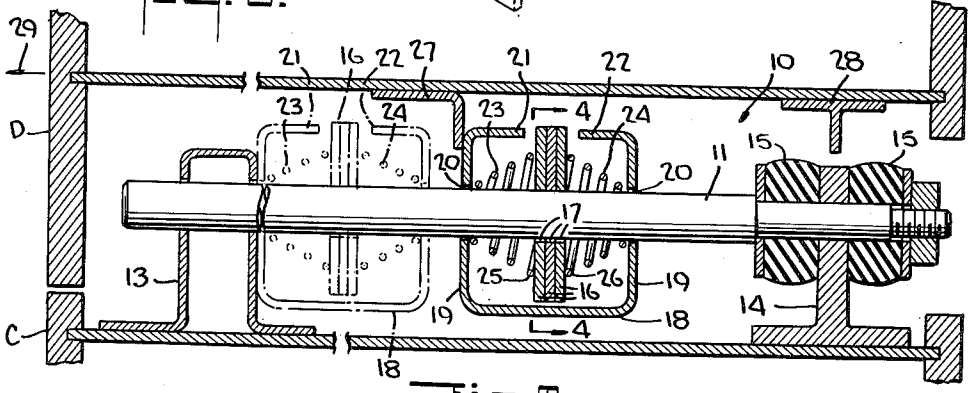
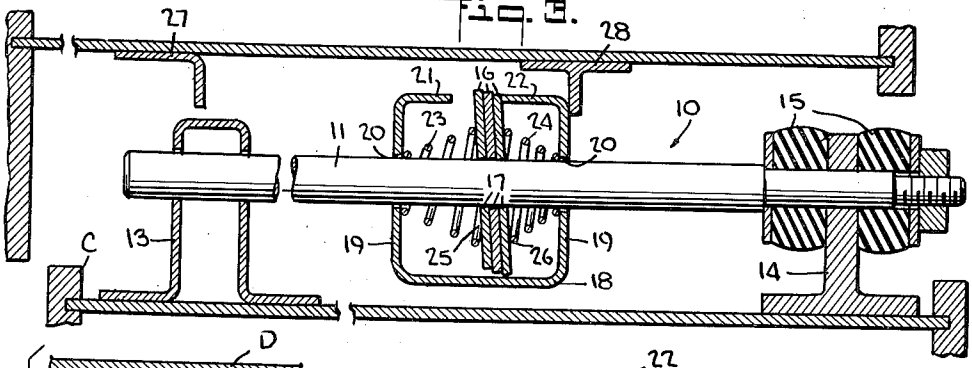


Fig. 3.



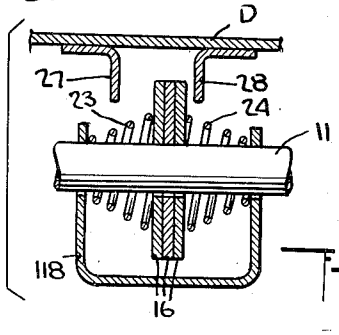


Fig. 5.

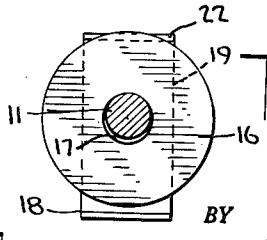


Fig 4.

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3,017,655
DRAWER CONTROL

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7 Claims. (Cl. 16—82)

This invention relates to a device for controlling the movements of a drawer or the like.

In drawer cabinets and other furniture having a drawer, there generally is provided a stop for the outward sliding movement of the drawer. Naturally, there also will be a part which acts as a stop for the inward or closing movement of the drawer. However, mere stops are not entirely satisfactory when the drawer is moved at a fast rate of speed. That is because the momentum of the drawer will effect considerable shock between the drawer and cabinet, even though the stops may be cushioned. Eventually, shocks due to fast drawer movements will damage some portion of the drawer or cabinet. Through the exceedingly novel concept of my invention, I am able to check the speed of a drawer very effectively, so that the drawer will move at a rather slow rate as it reaches a stop position. It then is possible to absorb shock effectively between the drawer and the cabinet.

As an important feature of my invention, I utilize means that will move with the drawer during at least a part of the movement of the drawer toward open or closed position. Those means normally will move rather freely, so as to have practically no retarding effect on the drawer. However, should the drawer move rapidly, the means that move with the drawer will act automatically to grip a part on the cabinet, thus checking the drawer movement. Therefore, in moving toward a stop position the drawer must move at a relatively low speed, so as to avoid the shock that would be due to a rapid movement of the drawer.

Since my novel control device will move freely at a low speed, those persons who use care in moving the drawer will find they can do so without noticeable resistance to the movement. A person attempting to move the drawer rapidly will at once find that he must use a slower movement if the drawer is to reach a full open or closed position.

As a detailed feature of my invention, I utilize a shaft that is secured to the cabinet, and one or more plates having each an opening whereby it is assembled on the shaft. Each plate is spring-pressed to a position in which it can slide freely on the shaft, but when tilted against its spring pressure will grip the shaft so as to oppose sliding of the plate. I then utilize means through which the drawer normally will slide the plate, but that will effect yielding of the springs whereby to tilt the plate should the drawer move too fast. Thus, the plate will act very effectively to limit the speed of the drawer as it moves in one direction or the other. Actually, through the utilization of my plate or plates I am able to construct a drawer control that is low in cost and relatively simple, but that will be extremely effective to prevent shocks that are due to the movements of a drawer in a cabinet.

I have thus outlined rather broadly the more important features of my invention in order that the detailed description thereof that follows may be better understood, and in order that my contribution to the art may be better appreciated. There are, of course, additional features of my invention that will be described hereinafter and which will form the subject of the claims appended hereto. Those skilled in the art will appreciate that the conception on which my disclosure is based may readily be utilized as a basis for the designing of other structures for carrying out the several purposes of my invention.

It is important, therefore, that the claims be regarded as including such equivalent constructions as do not depart from the spirit and scope of my invention, in order to prevent the appropriation of my invention by those skilled in the art.

Referring now to the drawings,

FIG. 1 shows my invention utilized for controlling the movements of a drawer relatively to a part of a cabinet, the drawer being shown partly in phantom;

FIG. 2 is a longitudinal section showing my novel drawer control;

FIG. 3 shows a section somewhat like FIG. 2, but with my control in actuated position;

FIG. 4 is a cross section on the line 4—4 in FIG. 2;

FIG. 5 shows a section of a further form of my invention.

Referring now more particularly to the drawing, I show my novel drawer control, indicated generally by the numeral 10, applied between the bottom of a drawer D and a part of a cabinet C. As a part of my drawer control 10, I utilize a member 11 that preferably is a metal shaft, and that is secured to the cabinet C in position extending longitudinally in the direction of the movement of drawer. In the construction that I illustrate in FIGS. 1 to 4, the shaft 11 is mounted in openings in a pair of brackets 13, 14, on the cabinet C, and is held against substantial sliding in those openings through rubber members 15 on opposed sides of bracket 14. Of course, the rubber members 15 will yield to absorb some longitudinal movements of shaft 11, for reasons that will presently appear.

On the shaft 11, I assemble at least one plate 16 having an opening 17 that will provide a small clearance relatively to the shaft so that the plate normally can slide freely on the shaft. In my preferred construction, I utilize a series of plates 16, and those plates are in the form of steel washers, but it is to be understood that I may use the number of plates that may be desired for a particular application, and that the plates may be of any suitable material.

Together with the washers 16, I utilize a spring supporting frame 18, FIG. 2, having end portions 19 extending in spaced relation to opposed faces of the washers 16, those portions 19 having openings 20 whereby the frame 18 is mounted to slide on the shaft. The end portions 19 of the frame 18 have parts 21, 22 that extend in aligned relation to side portions of the washers 16, and that normally lie a short distance from opposed faces of the series of washers 16 as shown in FIG. 2.

Referring again to FIG. 2, I assemble between the end portions 19 on frame 18 and the corresponding faces of the series of washers 16 a pair of coil springs 23, 24 that encircle shaft 11. Those springs 23, 24 normally hold the washers 16 in a medial position relatively to the frame parts 21, 22. Further, portions 25, 26 of the springs press the washers 16 to a perpendicular position relatively to shaft 11, in which position the washers 16 can slide freely along the shaft. It will be seen that the series of washers 16 and the frame parts 21, 22 can move into contact with one another, as will be described, should the springs 23, 24 yield due to a predetermined force.

To the bottom of the drawer D, I secure a pair of brackets 27, 28 that extend into position for engaging opposed ends of the spring supporting frame 18, but that are positioned a considerable distance apart. The arrangement preferably is such that the bracket 28 will not engage the frame 18 until the drawer D has moved from closed position some distance in the direction of the arrow 29 in FIG. 2 toward open position. Similarly, the bracket 27 will not engage the frame 18 until the drawer D has moved from open position some distance toward closed position. It will thus be seen that the drawer D will have

a certain amount of movement before one or the other of the brackets **27**, **28** on the drawer will engage the frame **18**. I will now explain the particular operation that takes place when one of the brackets **27**, **28** moves against frame **18**.

If we assume that the drawer D is moved toward open position at an allowable slow speed, bracket **28** on the drawer will move against the frame **18** and will slide that frame with washers **16** along the shaft **11** in the direction of drawer movement. That is possible because the bracket **28** has moved against the frame **18** with a relatively low pressure, enabling the springs **23**, **24** to hold the washers **16** in their normal position, which is shown in FIG. 2. Those washers then will have no noticeable retarding effect on the movement of the drawer D, and the drawer can move easily to its open position. As the drawer D reaches open position, the frame **18** may move against the bracket **13** on the cabinet, thus acting as a limit stop for the opening movement. However, I do not wish to be restricted to that arrangement, since a separate and more conventional limit stop may conceivably be used.

If we assume now that the drawer D is moved too rapidly toward open position so that bracket **28** on the drawer strikes frame **18** with considerable force, that force will cause the spring **24** to yield so that the frame **18** will move its portion **22** against the washers **16**. Since the portion **22** engages a side portion of washers **16**, it will cause the washers to tilt through yielding of the spring portions **25**, **26**, so that the washers **16** then are in the position shown in FIG. 3. When the washers **16** are in that tilted position, their openings **17** will firmly grip the shaft **11**, so as to oppose further movement of the drawer D. The rubber members **15** naturally will yield to absorb that shock which may be due to the gripping action of the washers **16**.

Thereby the opening movement of drawer D will be effectively checked, but may nevertheless be resumed at the proper low rate of speed, once the opening pressure on the drawer is removed to enable springs **23**, **24** to move washers **16** to their normal release position, as shown in FIG. 2.

We shall now see what happens should the drawer D be accelerated beyond a predetermined rate during the latter part of its opening movement. We will assume that the bracket **28** on the drawer already is in contact with the frame **18**, as is shown in FIG. 2, and is sliding the frame and washers **16** along shaft **11**. If the drawer now is rapidly accelerated, the spring **24** again will yield due to the pressure that is applied through bracket **28**, causing the frame portion **22** to tilt the washers to their FIG. 3 position. The washers **16** again will act to check the drawer movement in the manner that I have described, so that it will be necessary to use care in order to move the drawer D to its full open position.

I believe that the manner in which my invention will control the opening movements of the drawer D will now be understood, and that it will be unnecessary to describe in detail the control that is effected when the drawer moves to closed position. During the closing movement of the drawer, the operation of my invention will be the same as that I have described, but with the bracket **27** on the drawer moving against the opposed side of frame **18** for sliding the frame and washers **16** in the opposed direction, and with the frame part **21** adapted to tilt the washers. Whether the drawer moves in one direction or the other, my invention will enable me to control effectively the momentum with which the drawer moves to a limit position.

It will be appreciated that I may utilize equivalent arrangements in my novel drawer control, and I do not wish to be limited to the details of the construction that I show in FIGS. 1 to 4. For example, I may utilize the construction I have shown in FIG. 5 of the drawing, with a spring supporting frame **118** that will enable the drawer brackets **27**, **28** to apply pressure in direct contact with

the washers **16**. The springs **23**, **24** in FIG. 5 will hold the washers **16** in a normal position, as in FIGS. 1 to 4, when the bracket **27** or **28** acts with normal pressure to slide the washers **16** and frame **118** along shaft **11**. However, those springs will yield so that washers **16** will tilt when the pressure exceeds a predetermined amount, thus achieving the operation that I have described in connection with FIGS. 1 to 4.

Those persons skilled in the art will understand that I have contributed a novel drawer control that has a considerable value and that will be very effective to control the operation of a drawer, but that is rather simple and inexpensive. Of course, it will be understood that my novel control is not actually limited to use with a drawer, since it may have broader application to control the movements of parts relatively to one another. Therefore, I believe that the merits of my invention will be fully appreciated.

I now claim:

1. In a device of the class described for controlling the movements of a drawer relatively to a cabinet, a member secured to the cabinet, a part movable relatively to the member on the cabinet and formed with a gripping surface for coacting with said member, means initially out of contact with said part and moved by the drawer toward said part during a portion of the drawer movement, a portion of said means contacting the part and applying pressure for moving said part along said member as the drawer continues to move, spring means normally pressing said part to a release position in which its gripping surface can move along said member on the cabinet so as to allow the continued movement of the drawer, and a portion of said spring means yielding so that said part moves to a gripping position when the pressure applied by the contacting means exceeds a predetermined amount, as when the drawer rapidly moves the contacting means against the part, whereby said gripping surface then grips said member to oppose the drawer movement.

2. In a device of the class described for controlling the movements of a drawer relatively to a cabinet, a member secured to the cabinet in position extending longitudinally in the direction of drawer movement, a plate having an opening whereby it is assembled to said longitudinal member, means through which the drawer applies pressure to said plate for sliding it along said member during the drawer movement, spring means pressing said plate to a normal position in which its opening slides freely along said member on the cabinet so as not to oppose the movement of the drawer, and said pressure applying means arranged to act against a side portion of the plate whereby to tilt the plate through yielding of the spring means when the pressure exceeds a predetermined amount, as when the drawer is rapidly accelerated, so that the edge of the plate opening then grips said member on the cabinet to oppose the drawer movement.

3. In a device of the class described for controlling the movements of a drawer relatively to a cabinet, a member secured to the cabinet in position extending longitudinally in the direction of drawer movement, a plate having an opening whereby it is assembled to said longitudinal member, means through which the drawer applies pressure to said plate for sliding it along said member during the drawer movement, a spring support adapted to move with said plate along said member, a spring acting between each opposed face of the plate and said spring support whereby to press said plate to a normal position in which its opening slides freely along said member on the cabinet so as not to oppose the movement of the drawer, and portions of said springs yielding so that said plate tilts to a gripping position when the pressure applied by said drawer exceeds a predetermined amount, with the edge of the plate opening then gripping said member to oppose the drawer movement.

4. In a device of the class described for controlling the movements of a drawer relatively to a cabinet, a shaft se-

cured to the cabinet and extending along the direction of drawer movement, a washer assembled on the shaft and acting when tilted to grip said shaft, spring means pressing the washer to a position normal to the shaft so that said washer can slide freely along said shaft, means through which said drawer acts against an edge portion of the washer to slide the washer during the drawer movement, and a portion of said spring means yielding so that the washer tilts when the drawer acts with predetermined pressure against the edge portion of the washer, whereby the washer then grips said shaft to oppose the drawer movement.

5. In a device of the class described for controlling the movements of a drawer relatively to a cabinet, a shaft secured in position extending longitudinally in the direction of drawer movement on the cabinet, a washer assembled on the shaft, means initially out of contact with said washer and moved by the drawer toward said washer during the drawer movement, a portion of said means contacting a side portion of said washer and applying pressure for sliding the washer along said shaft as the drawer continues to move, a spring support adapted to slide with said washer on the shaft, a spring acting between each opposed face of said washer and said spring support whereby to press said washer to a normal position in which its opening slides freely along said shaft so as not to oppose the movement of the drawer, and portions of said springs yielding so that said washer tilts when the pressure applied to the washer exceeds a predetermined amount, as when the drawer rapidly moves the contacting means against the side portion of the washer, or when the drawer is accelerated, so that the opening of the washer then grips said shaft to oppose the drawer movement.

6. In a device of the class described for controlling the movements of a drawer relatively to a cabinet, a longitudinal member secured to the cabinet in position extending in the direction of the drawer movement, a movable assembly including a part formed with a gripping surface for coacting with the longitudinal member, said assembly further including spring means normally pressing said part to a release position relatively to said member, actuating means through which said drawer applies pressure to move said assembly along the longitudinal member during the drawer movement, and portions on said assembly and actuating means coacting to move said part against its spring pressure when the pressure applied by the drawer exceeds a predetermined amount, whereby said gripping surface grips the longitudinal member to oppose the drawer movement.

7. In a device of the class described for controlling the movements of a drawer relatively to a cabinet, a shaft secured to the cabinet in position extending in the direction of drawer movement, an assembly movable on said shaft and including a plate formed with an opening through which the shaft extends so that the plate when tilted grips said shaft, said assembly further including spring means pressing the plate to a position normal to the shaft so that the assembly can slide freely along said shaft, actuating means through which the drawer applies pressure to slide the assembly during the drawer movement, and portions on said assembly and actuating means coacting to tilt said plate against its spring pressure when the pressure applied by the drawer exceeds a predetermined amount, said plate then being effective to oppose the drawer movement.

References Cited in the file of this patent

UNITED STATES PATENTS

981,637	Grauel	Jan. 17, 1911
1,091,670	Kump	Mar. 31, 1914
1,349,037	Axe	Aug. 10, 1920
1,352,875	Chaffee	Sept. 14, 1920