May 25, 1943. N. A. GUSSACK 2,320,276

SLIDE DRAWER CONSTRUCTION

Filed June 14, 1940 2 Sheets-Sheet 1

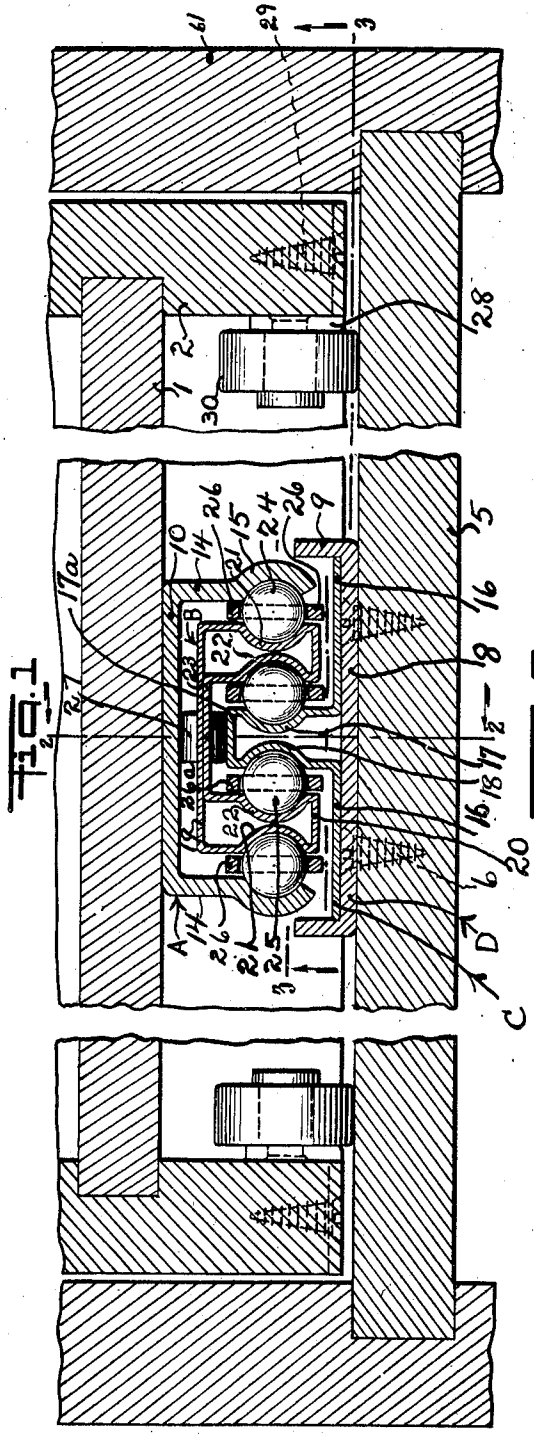


FIG. 1

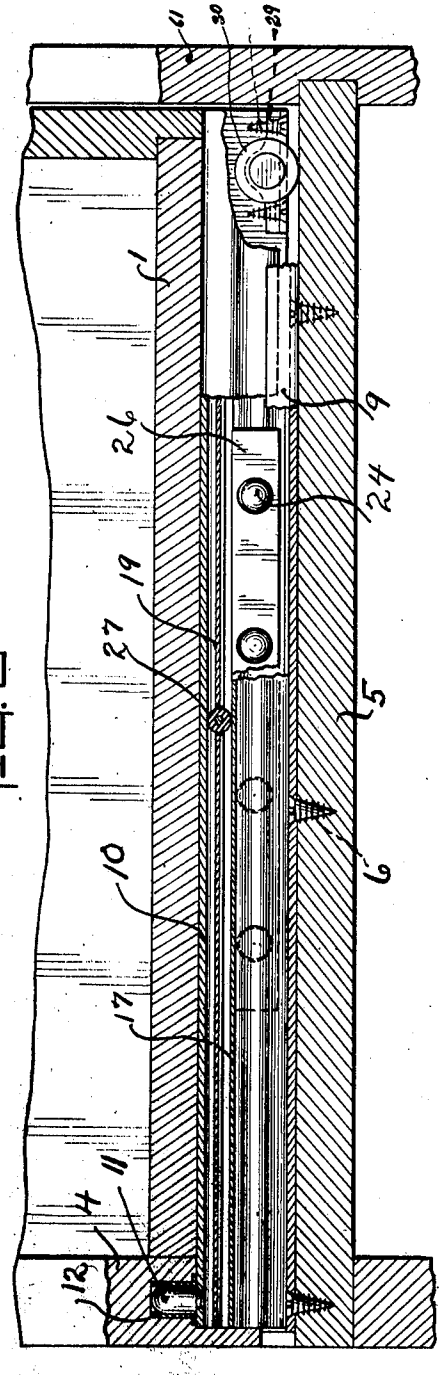


FIG. 2

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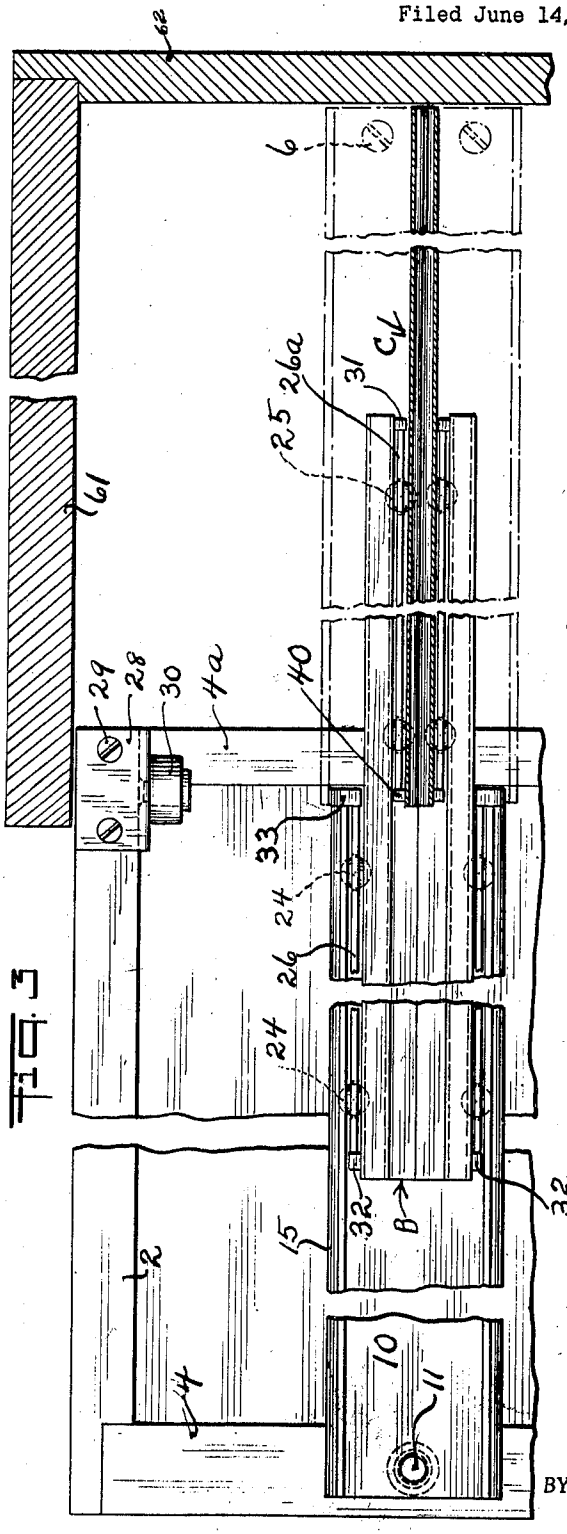


FIG. 3

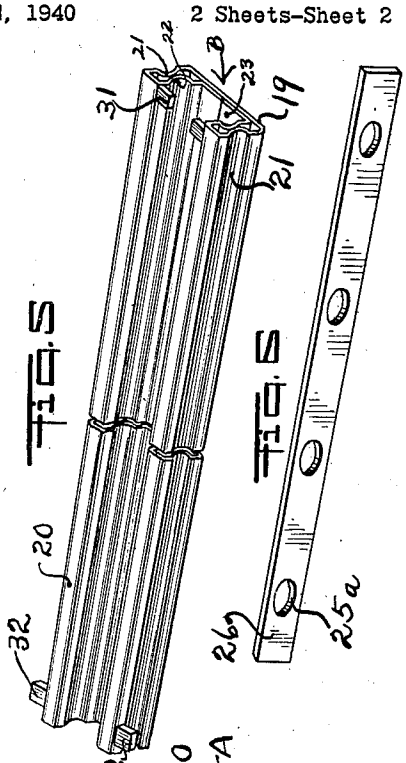


FIG. 5

FIG. 6

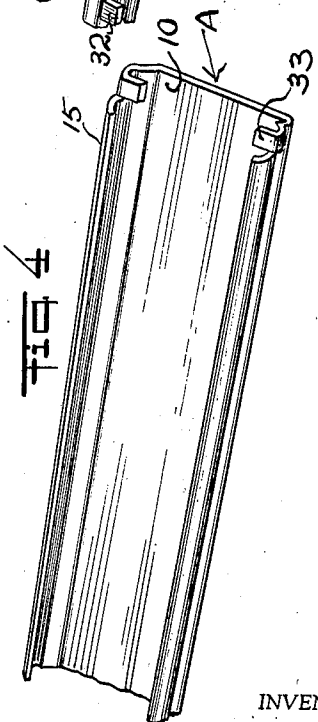


FIG. 4

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2,320,276

UNITED STATES PATENT OFFICE

2,320,276

SLIDE DRAWER CONSTRUCTION

Nathan A. Gussack, New York, N. Y.

Application June 14, 1940, Serial No. 340,527

3 Claims. (Cl. 308—6)

My invention relates to a new and improved slide drawer construction.

One of the objects of my invention is to provide improved slide means for guiding and supporting slidable drawers or shelves in desks, refrigerators, cabinets and other articles of furniture, and other devices.

Another object of the invention is to provide improved anti-friction means for this purpose, and to provide a device which can be cheaply manufactured and assembled.

Another object of the invention is to provide anti-friction balls or the like, which are movably mounted in retainers which act as stops.

Other objects of my invention will be set forth in the following description and drawings which illustrate a certain preferred embodiment, it being understood that the above statement of the objects of my invention is intended to generally explain the same without limiting it in any manner.

Fig. 1 is a transverse section of a drawer which has slidable supporting means made according to my invention. This figure also shows the frame in which the drawer is slidably mounted.

Fig. 2 is a sectional view, partially in elevation, along the line 2—2 of Fig. 1, the representation of a part of the device having been omitted in order to show certain parts more clearly.

Fig. 3 is a sectional view, partially in elevation, on the line 3—3 of Fig. 1.

Fig. 4 is a perspective view of the top supporting member.

Fig. 5 is a perspective view of the intermediate supporting member.

Fig. 6 is a perspective view of one of the retainers for the anti-friction balls.

The drawer has a bottom wall 1 and vertical side walls 2 which extend above and which also depend below the bottom wall 1. Said drawer also has a front wall 4 and a rear wall 4a. The drawer is slidably located in a frame which has a bottom supporting-wall 5, vertical side walls 61 and a vertical rear wall 62. The drawer is slidable outwardly and inwardly relative to said supporting-wall 5.

A bottom supporting member D is connected to the bottom wall 5 of the frame, by means of screws 6 whose heads are countersunk in the horizontal web or wall 8 of said bottom member D. Said bottom member D is of U-shaped cross-section, so that it has vertical walls 9. An insert or bottom longitudinal member C has a bottom wall 16 which is connected to the bottom wall 8 of the member D, in any suitable manner, such as by spot-welding or the like. The bottom wall 16 of the member C is integral with first upstanding walls which are integral with a top wall 17a. Said upstanding walls of the member C are provided with first longitudinal grooves 17 and 18. These first upstanding walls are located intermediate the longitudinal edges of the bottom longitudinal member C.

The intermediate or second longitudinal member B is provided with a top wall 19 which has depending walls which are provided with longitudinal grooves or recesses 21. Said depending walls may be designated as the outer longitudinal walls of the member B. Said outer depending walls of member B are integral with bottom walls 20. Said bottom walls 20 are integral with upstanding walls which have the longitudinal grooves or recesses 22. Said upstanding walls may be designated as the inner longitudinal walls of the member B. The adjacent convex faces of grooves 21 and 22 may abut each other, or be spaced from each other. Said inner longitudinal walls are integral with horizontal legs 23 whose top surfaces abut the bottom surface of the top wall 19. The longitudinal edge walls of the legs 23 abut each other.

A top supporting member A has a top wall 10 upon which the bottom wall 1 of the drawer is supported. This member A may be designated as a third longitudinal member. Said top wall 10 of the member A is provided at its front end with an upstanding pin 11 which may be riveted or otherwise suitably secured to said top wall 10. The front wall 4 of the drawer is provided with a bushing 12 in which said pin 11 is removably located so that the drawer and the top member A slide in and out of the frame in unison. The top wall 10 of the member A is integral with depending walls 14 which are provided with longitudinal grooves or recesses 15.

Two outer rows of spaced anti-friction balls 24 are located in the aligned pairs of longitudinal grooves or recesses 15 and 21. Two rows of spaced anti-friction balls 25 are located respectively between the adjacent longitudinal grooves or recesses 17 and 22 and the adjacent longitudinal grooves or recesses 18 and 22.

Each row of the outer longitudinal balls 24 is located partially in the holes 25a of an outer retainer 26. The balls 24 are freely turnable in said holes 25a. Each row of the inner balls 25 is located partially in the holes of an inner retainer 26a which is identical with the retainer 26. The inner balls 25 are also freely turnable relative to their respective retainers.

At its rear end, the top member A is provided with inwardly bent integral tongues 33. The intermediate member B is provided with inwardly directed tongues 31 at its rear end, and with outwardly directed tongues 32 at its front end. The insert C is provided with outwardly directed tongues 40 at its front end. The aforesaid tongues, and particularly the tongues 32, may be detachably connected to their respective associated members.

All the parts of the device can be made out of any suitable metal or other material. The members D, C, A and B can be respectively made by stamping or rolling respective integral blanks, or any of these members can be made of two or more parts which can be suitably connected to each other.

The depending portions of the vertical side walls 2 of the drawer have brackets 28 connected thereto adjacent the rear end of the drawer, by means of screws 29. Rolls 30 are turnably mounted on studs of said brackets 28. Said rolls 30 rest turnably upon the bottom wall 5 of the frame. Any desired number of said brackets 28 and of said rolls 30 may be provided at each side wall of the drawer. A roll 27 is turnably supported by means of a pivot pin or the like in the top horizontal wall 19 of the intermediate member B. Said roll 27 turnably abuts the top surface of the top wall 17*a* of the member C. It may also abut the bottom surface of the top wall 18. The construction may include a plurality of said rolls 27.

The rear end of the member D or of the member C can be provided with any suitable upstanding stud so as to limit the rearward movement of the member B.

The operation of the device is as follows:

When the drawer is pulled forwardly out of the frame, said drawer is supported upon the top wall 19 of the member A. Said top wall 19 is supported movably by the turnable roll or rolls 27 upon the top wall 17*a* of the stationary member C. The weight of the drawer is transmitted by the rows of balls 24 to the intermediate member B, which transmits said downward force to the insert C, through the rows of balls 25. The rows of balls 24 and 25 can turn freely relative to their retainers 26 and 26*a* during this forward movement of the member A. The rear ends of the outer retainers 26 abut the tongues 33 at the rear of the member A, when the drawer is inserted fully into its frame so that said retainers 26 are moved forwardly in unison with the forward movement of the drawer and of the member A.

After the drawer has been partially pulled out, the front ends of the retainers 26 strike the outwardly directed tongues 32 of the member B, so that the member B is moved forwardly in unison with the member A. The rear ends of the inner retainers 26*a* about the inwardly directed tongues 31 of the member B, so that said inner retainers 26*a* are moved forwardly in unison with the member B. The forward movement of the member B is continued until the front ends of the inner retainers 26*a* abut the outwardly directed tongues 40 which are fixed to the stationary member C. When the drawer is moved either rearwardly or forwardly, the members A and B may move relative to each other to a certain extent, since the balls 24 and 25 are not absolutely non-frictional. Hence, the member B may be moved forwardly during the forward movement of the drawer, before the retainers 26 strike the tongues 22.

The parts of the device can be easily assembled.

The members D, C, B and A can be readily assembled, prior to connecting member D to the bottom wall 5 of the frame.

The member C is connected to member D by spot-welding or the like. The bottom wall 16 of member C is provided with holes which register with the holes in the bottom wall 8 of member D, through which the screws 6 can be inserted into the bottom wall 5 of the frame.

The member B is then slid on member C, at the rear end of said member C. The stop on the rear end of member C, if such stop is used, can be connected to the rear end of member C after the members D, C, B and A have been assembled.

The inner retainers 26*a*, together with the inner balls 25, can then be inserted, since said retainers 26 are slidable relative to members C and B.

The tongues 31 may be non-integral with member B. Hence the member B may first be located on member C, the retainers 26*a* and their balls can be inserted between members B and C through the rear end of member B, and tongues 31 can then be connected to member B.

The retainers 26*a* and member B can be loosely assembled before sliding member B and retainers 26*a* into position on member C, at the rear end of member C.

The member A and its retainers 26 can then be assembled with member B by sliding said members A and 26 into position at the rear end of member B.

The retainers 26, together with their balls 24, can be slid into position at the front of member B, before the tongues 32 are connected to member B, and said tongues 32 can then be connected to member B.

The base member D and its slides B and A can therefore be readily assembled, as a sub-unit, before connecting said sub-unit by screws 6 to the bottom wall 5 of the frame.

The invention includes sub-combinations which can be used independently of the complete combination specified herein. It includes a device in which a single row of balls is used, and a device which has any desired number of longitudinal rows of balls. The anti-friction balls may be applied by anti-friction members of any suitable shape. The anti-friction members take up at least part of the weight of the device, since the members 27 and 30, or either the member 27 or the members 30, can be omitted. For convenience, the slides will be designated as superposed slides, on the assumption that the drawer is moved back and forth along a horizontal line. However, the invention applies to a construction in which the drawer is moved back and forth along a line which makes any angle with a horizontal plane. The anti-friction members not only take up the weight of the drawer, or at least part of said weight, but in addition they laterally space the superposed slides. The invention also applies to a device in which a single slide is employed.

It will be noted that the supporting means are located wholly at the underside of the drawer, and that said supporting means are substantially invisible when the drawer is pulled out.

The drawer can be easily removed from the top wall 19 of the top supporting member A, because the only connection between said top wall 19 and the drawer consists of the pin 11 and the

corresponding recess which is provided in the front wall 4 of the drawer.

The roll or rolls 27 provide anti-friction supporting means between the longitudinal rows of anti-friction balls 24 and 25. The roll 27 therefore supports the drawer at its median line. When the drawer is pulled outwardly, the weight of the drawer causes the roll 27 to turn in a counter-clockwise direction, referring to Fig. 2. Since the roll 27 is pressed against the top wall 17a, this will cause a corresponding forward movement of the intermediate member B. However, the outward longitudinal movement of the drawer is twice as great as the outward longitudinal movement of the member B, which is caused by the roll 27. There may be more than one roll 27, as these may be arranged in a straight longitudinal row which is parallel to the median longitudinal line of the drawer.

I have shown a preferred embodiment of my invention, but it is clear that numerous changes and omissions could be made without departing from its spirit.

I claim:

1. In combination, a frame which has a horizontal supporting wall, a drawer having a bottom horizontal wall which is located above said supporting wall, said drawer being longitudinally slidable forwardly and rearwardly relative to said supporting wall, a bottom longitudinal member fixed to said supporting wall, said bottom member having upstanding walls which are provided with first longitudinal grooves, additional drawer-supporting longitudinal walls which are slidable forwardly and rearwardly relative to said bottom member, said drawer-supporting longitudinal walls having second longitudinal grooves, said first longitudinal grooves and said second longitudinal grooves being arranged in respective pairs, a retainer located intermediate each said pair of grooves, each said retainer having perforations, each said retainer having balls turnably located in said perforations and also turnably fitting in the grooves of the respective pair of grooves, the bottom member having stops against which the front ends of the retainers can abut to limit the forward movement of said retainers, said drawer-supporting longitudinal walls having lugs which strike the rear ends of the retainers when said drawer-supporting walls are moved forwardly, the longitudinal distance between said stops and said lugs exceeding the lengths of said retainers when said drawer-supporting walls are in their extreme rear position.

2. A drawer-receiving frame which has a fixed supporting wall, a longitudinally slidable drawer slidable rearwardly into and forwardly out of said frame, said drawer having a bottom wall located above said supporting wall, a bottom member fixed to said supporting wall and having upstanding longitudinal walls, an intermediate slidable member having a top wall which is located between the tops of said upstanding walls and said bottom wall, said intermediate member having outer longitudinal walls and inner longitudinal walls, auxiliary longitudinal walls fixed to said bottom wall, each said longitudinal wall having a longitudinal guide-groove, inner retainers located between said upstanding walls and said inner longitudinal walls, outer retainers located between said outer longitudinal walls and said auxiliary walls, said retainers having anti-friction balls which are located partially and turnably in the respective pair of grooves, said auxiliary walls having tongues which abut the rear ends of said outer retainers when the drawer is slid forwardly, said intermediate member having tongues against which said outer retainers abut when said outer retainers are slid forwardly, said intermediate member having additional tongues which abut the rear ends of said inner retainers when said intermediate member is slid forwardly, said bottom members having stops to limit the forward sliding movement of the inner retainers.

3. A device according to claim 2, in which said outer longitudinal walls depend from said top wall and said intermediate member, and the upper ends of said longitudinal walls are integral with lateral flanges which are located below and which are fixed to said top wall.

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