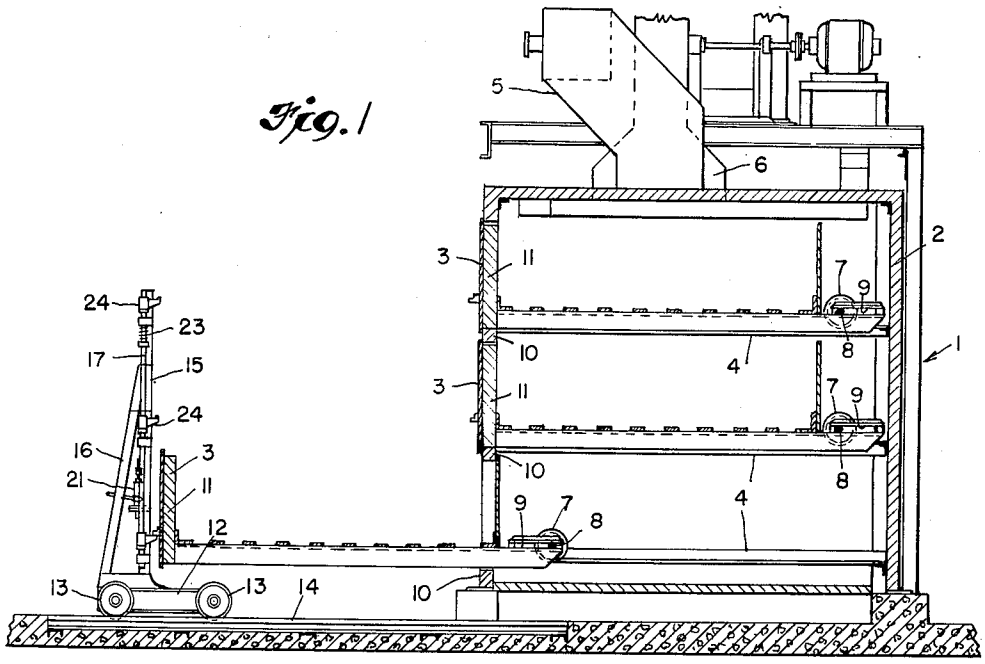
March 16, 1954 C. A. BARNETT ET AL 2,672,246

DRAWER OPERATING MECHANISM

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Fig. 1



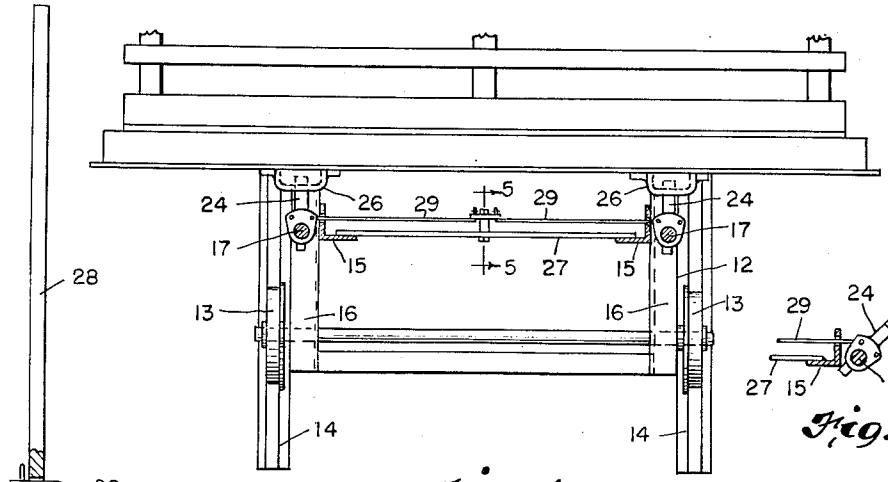


Fig. 4

Fig. 6

Fig. 5

INVENTORS
CHARLES A. BARNETT AND
BY CHARLES H. BARNETT

Oberlin & Limbach
ATTORNEYS.

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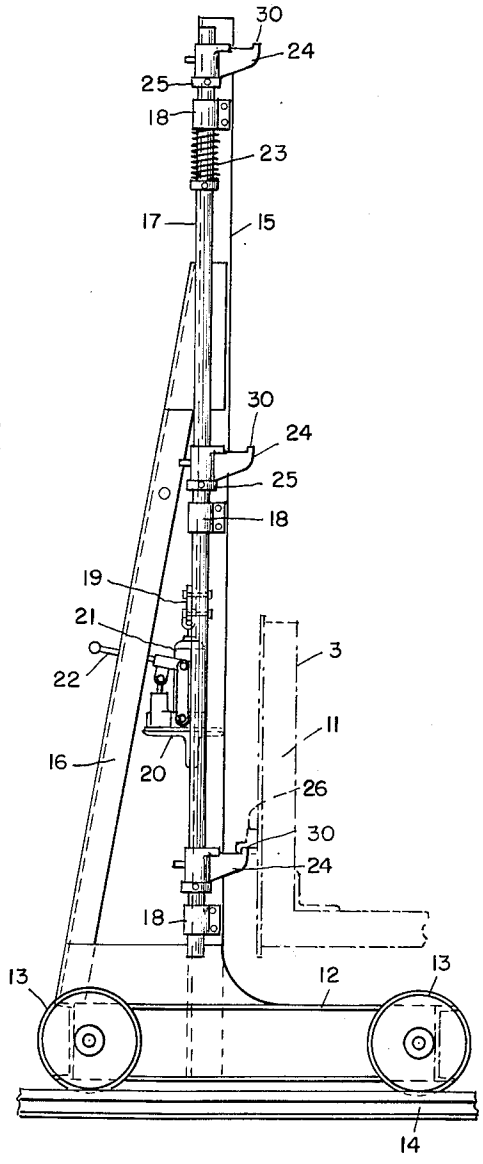


Fig. 2

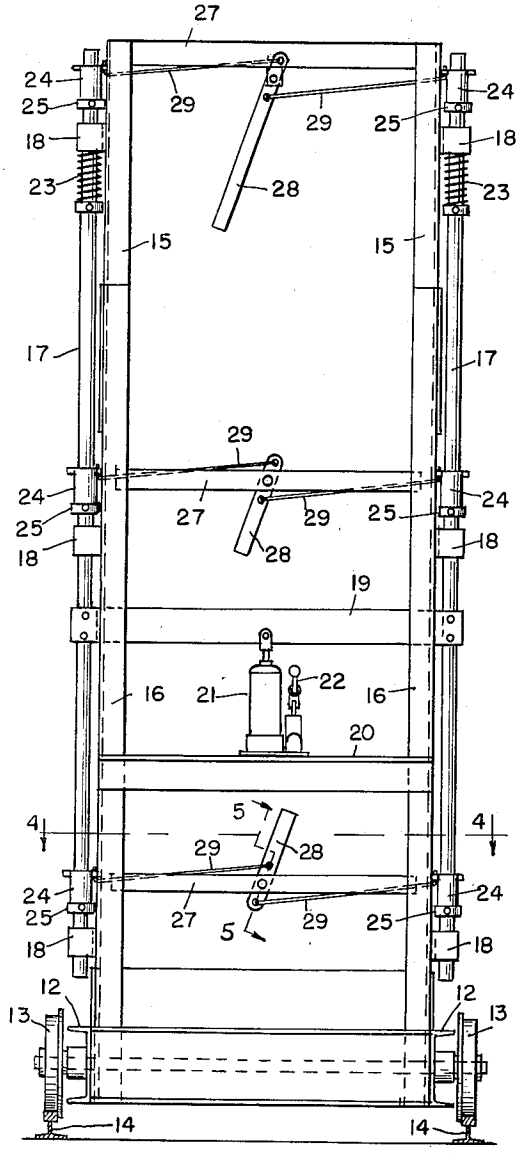


Fig. 3

INVENTORS
CHARLES A. BARNETT AND
BY CHARLES H. BARNETT.

Oberlin & Limbach
ATTORNEYS.

March 16, 1954 C. A. BARNETT ET AL 2,672,246

DRAWER OPERATING MECHANISM

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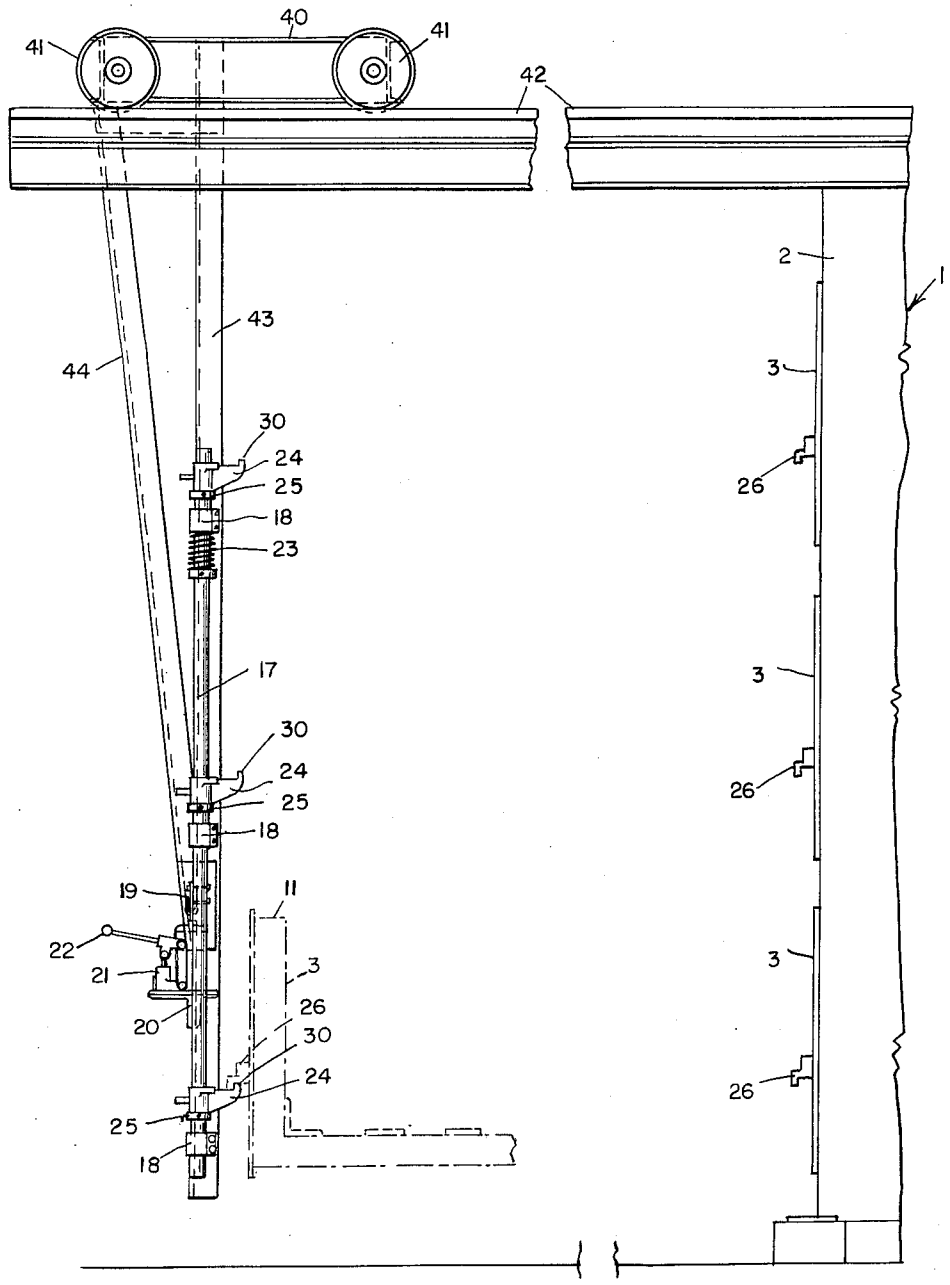


Fig. 7

INVENTORS
CHARLES A. BARNETT AND
CHARLES H. BARNETT
BY
Oberlin & Limbach
ATTORNEYS.

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DRAWER OPERATING MECHANISM

Charles A. Barnett and Charles H. Barnett,
Cleveland, Ohio

Application May 1, 1948, Serial No. 24,657

4 Claims. (Cl. 214—18)

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The present invention while relating generally as indicated to a drawer operating mechanism is more particularly concerned with certain improvements in such mechanism for facilitating selective operation of any one or more of a plurality of superimposed drawers in a drawer type oven for baking and heat treating cores, molds, and the like carried on said drawers.

A primary object of this invention is to provide a mechanism which is of a simple and sturdy construction and enables efficient and safe operation of heavily loaded drawers of the character referred to.

Other objects and advantages will become apparent as the following description proceeds.

To the accomplishment of the foregoing and related ends, said invention, then, comprises the features hereinafter fully described and particularly pointed out in the claims, the following description and the annexed drawings setting forth in detail a certain illustrative embodiment of the invention, this being indicative, however, of but one of the various ways in which the principle of the invention may be employed.

In said annexed drawings:

Fig. 1 is a side elevation view of one embodiment of the present invention in a position with the bottom drawer of the associated oven withdrawn, said oven and the drawers thereof being shown in vertical cross-section;

Fig. 2 is a view similar to Fig. 1 except on a larger scale and with the front portion of the withdrawn drawer represented by dot-dash lines;

Fig. 3 is a front elevation view as viewed from the lefthand side of Fig. 2;

Fig. 4 is a cross-section view taken substantially along the line 4—4, Fig. 3;

Fig. 5 is a cross-section view on an enlarged scale taken substantially along the line 5—5, Fig. 3;

Fig. 6 is a cross-section view of one of the parts of Fig. 4, illustrating the same in a different position; and

Fig. 7 is a side elevation view of a modified form of the invention.

Referring now to the drawings and first more particularly to Fig. 1 thereof, there is shown therein a drawer type oven 1 comprising a cabinet 2 supporting a plurality of superimposed drawers 3 therein, as on forwardly extending members 4 disposed below said drawers, for movement into and out of said cabinet. Leading into said oven 1 are ducts 5 and 6 for circulating heated air or gas therethrough and through suitable interior ducts (not shown) and thus through and around the cores and molds or like work carried on said drawers.

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Each drawer 3 is provided with a pair of rollers 7 at its rear end engaging the members 4, said rollers preferably being non-rotatably secured on an axle 8 transversely across said drawer and passing through slots 9 formed in said drawer inwardly adjacent each roller. With such roller arrangement, operation of said drawer effects rolling of the rollers 7 on members 4 and concurrent rolling of the axle 8 along the upper walls of slots 9 without sliding thereby obviating the necessity of providing bearings which not only require periodic lubrication but often "freeze" due to the effect of heat on the lubricant.

The front end of each drawer rests upon a cross member 10 therebelow and is thus retained by friction within said oven, the upper edge of the front panel 11 of each drawer having a sufficient clearance with the cabinet parts thereabove to permit slight raising of the front end of each drawer when it is desired to operate the same. As will hereinafter be more fully explained, the mechanism constituting the present invention is operative to effect such slight raising of the front end of the drawers and to provide a wheeled carriage 12 which together with the rollers 7 on the rear ends of the drawers support the latter for free operation into and out of said oven.

As best illustrated in Figs. 2–6, said carriage 12 has two pairs of wheels 13 journalled thereon and is freely movable toward and away from oven 1 by the rolling of said wheels on rails 14 extending forwardly from the base of said oven. Said carriage 12 comprises a pair of upstanding members 15 suitably braced as by diagonal braces 16.

Vertically reciprocable on said carriage 12 is drawer lift mechanism comprising a pair of vertically disposed bars 17 slide guided in eyes 18 projecting laterally from members 15, said bars being connected together by a cross beam 19 having its opposite ends bolted or otherwise secured to said bars. Below beam 19 is another beam 20 extending across and secured to members 15.

Between said beams 19 and 20 is a suitable lifting device, herein exemplarily illustrated as comprising a hydraulic jack 21 of any desired construction operated by oscillation of the lever 22 thereon. For lowering said drawer lift mech-

anism from a raised position and in response to release of said jack 21, coil springs 23 may be employed in the manner illustrated to assist gravity or if desired said jack may be of a double acting type for effecting both positive raising and lowering of said lift mechanism.

On said bars 17 are a plurality of lifting fingers 24 positioned vertically thereon in pairs by collars 25 so that when said lift mechanism is in a lowered position, said pairs of fingers may be selectively swung about bars 17 to a position either under or clearing the pair of drawer pulls 26 on each drawer.

To thus swing each pair of fingers 24, there is provided a cross bar 27 between members 15 to which a lever 28 is pivotally connected, said lever having oppositely extending rods 29 connected thereto and to the associated pair of fingers 24 in the manner best illustrated in Figs. 3, 4, 5, and 6 whereby oscillation of said lever to one position causes simultaneous outward swinging of said fingers 24 (see Fig. 6) so as to clear the drawer pulls 26 of the associated drawer 3 and oscillation to an opposite position causes simultaneous inward swinging of said fingers so as to be disposed directly below the associated drawer pulls (see Fig. 4). Each finger 24 has an upward projection 30 fitting into said drawer pull 26 when said finger is raised. In Fig. 3 all three pairs of said fingers 24 and the actuating levers 28 therefor are illustrated in a position for raising and drawing out of the three superimposed drawers 3 of oven 1. Obviously, a counter-clockwise swinging of said levers will effect outward swinging of said fingers to positions clearing the drawer pulls 26.

It is now apparent that with the lift mechanism in a lowered position, the carriage 12 may be moved toward the oven 1 and one or more of the levers 28 actuated to position the associated fingers 24 beneath the drawer pulls 26 of the drawer or drawers 3 which it is desired to operate. The jack 21 or other equivalent lifting device may then be operated whereupon the upward movement of the lift mechanism and thus of the fingers 24 will raise the front ends of the drawer or drawers 3 from the cross members 19. With the drawer or drawers 3 so raised, the carriage 12 may be moved away from oven 1, whereby the projections 30 on said fingers 24 in engaging the drawer pulls 26 will effect drawing out of the associated drawer or drawers. The rear ends of the drawers are, of course, supported on rollers 7 in the manner previously described. The treated work in the pulled-out drawers may then be unloaded therefrom and work to be treated placed thereonto and the carriage 12 moved toward oven 1 for moving the drawers thereinto. Thereafter, if it be desired to operate other drawers, the jack 21 is again released whereupon the lift mechanism drops by the combined action of gravity and the downward force exerted by springs 23. The levers 28 are then properly manipulated to position the proper fingers 24 beneath the drawer pulls of the drawers to be next drawn out of the oven.

It is to be understood that the carriage 12 may be in the form of a trolley 40 with wheels 41 thereon running on rails or beams 42 projecting forwardly from the top of the oven as illustrated in Fig. 7 and in the manner disclosed in Charles A. Barnett et al. Patent 1,959,518, dated May 22, 1934, of which the co-inventor, Charles A. Barnett, is one of the two joint inventors of the present improvements. In such modification,

the lift mechanism is vertically reciprocably suspended by the carriage or trolley 40 thereabove through the framework depending therefrom which comprises a pair of vertical members 43, braces 44, and a cross-member 20 joining together said members 43, but otherwise the construction of the lift mechanism including the hydraulic jack 21 between cross-members 19 and 20 and of the fingers and associated levers, etc., is the same as disclosed in Figs. 1 to 6, whereby repetition of the description thereof is not deemed necessary.

Although the foregoing description and the appended drawings refer particularly to a drawer oven, it is a matter of choice to employ the present drawer operating mechanism with any other similar structure wherein a cabinet or like enclosure slidably supports drawers therein.

Insofar as certain novel features of the present invention are concerned, the raising of the front ends of the drawers prior to operation thereof is not necessary. In such case the fingers 24 are first shifted horizontally to a position beneath the drawer pulls 26, or like means of the drawers, and then raised only enough to effect engagement between the fingers and the drawer pulls whereupon movement of the carriage operates the drawers. Furthermore, as previously indicated, it is a matter of indifference whether or not the carriage 12 runs on rails projecting forwardly from the base of the cabinet or is in the nature of a trolley 40 which runs on rails 42 projecting forwardly from the top of the cabinet. The term "carriage" as used herein and in the claims denotes both of these arrangements as well as any other arrangement providing a support and guide for the drawer operating mechanism.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the features stated in any of the following claims, or the equivalent of such, be employed.

We therefore particularly point out and distinctly claim as our invention:

1. In a drawer operating mechanism of the type which is adapted to be positioned directly in front of a drawer supporting structure having a series of superimposed sliding drawers therein each equipped with a pair of relatively widely spaced apart pulls and to be operatively connected to such drawers by raising of the mechanism to engage the same with said pulls on the drawers so that movement of said mechanism in a direction away from the structure effects withdrawal of the drawers, the combination of a horizontally movable carriage including vertical members and cross-beams joining together said members, a drawer lifting mechanism vertically reciprocably mounted on said carriage, said mechanism comprising a pair of vertical bars and cross-beams joining together said bars, an actuating device in the form of a jack which bears at its opposite ends on a cross-beam of said lifting mechanism and on a cross-beam of said carriage for raising said mechanism and for holding the latter in such raised position with respect to said carriage, and paired series of vertically spaced fingers respectively adapted to engage the pulls of the drawers, each pair of said series of fingers being vertically fixedly but independently horizontally movably carried by said bars of said lifting mechanism whereby said pairs of fingers may be selectively positioned to clear the drawer pulls and positioned directly beneath the drawer pulls for en-

gagement therewith upon raising of said lifting mechanism, and means for selectively moving said paired series of fingers in opposite directions only to the aforesaid positions.

2. In a drawer operating mechanism of the type which is adapted to be positioned directly in front of a drawer supporting structure having a series of superimposed sliding drawers therein each equipped with a pair of relatively widely spaced apart pulls and to be operatively connected to such drawers by raising of the mechanism to engage the same wtih said pulls on the drawers so that movement of said mechanism in a direction away from the structure effects withdrawal of the drawers, the combination of a horizontally movable carriage including vertical members and cross-beams joining together said members, a drawer lifting mechanism vertically reciprocably mounted on said carriage, said mechanism comprising a pair of vertical bars and cross-beams joining together said bars, an actuating device in the form of a jack which bears at its opposite ends on a cross-beam of said lifting mechanism and on a cross-beam of said carriage for raising said mechanism and for holding the latter in such raised position with respect to said carriage, and paired series of vertically spaced fingers respectively adapted to engage the pulls of the drawers, each pair of said series of fingers being vertically fixedly but independently horizontally swingably carried by said bars of said lifting mechanism whereby said fingers may be selectively swung between a position directly beneath the drawer pulls and a position laterally offset from the drawer pulls whereupon raising of said lifting mechanism engages only the fingers and pulls which are disposed directly above one another, and means for selectively moving said paired series of fingers in opposite directions only to the aforesaid positions.

3. In a drawer operating mechanism of the type which is adapted to be positioned directly in front of a drawer supporting structure having a series of superimposed sliding drawers therein each equipped with a pair of relatively widely spaced apart pulls and to be operatively connected to such drawers by raising of the mechanism to engage the same with said pulls on the drawers so that movement of said mechanism in a direction away from the structure effects withdrawal of the drawers, the combination of a horizontally movable carriage including a vertically extending framework rigid therewith having vertical members and cross-beams joining together said members, a drawer lifting mechanism comprising a pair of vertically disposed bars slide-guided in said framework and cross-beams joining together said bars, and paired series ofvertically spaced fingers respectively adapted to engage the pulls of the drawers, each pair of said paired series of fingers being fixed longitudinally of said bars so as to extend transversely therefrom and rotatable independently of the others of said series of fingers in a horizontal plane about said bars to clear the associated drawer pulls and to be disposed directly beneath the associated drawer pulls for engagement therewith upon raising of the lifting mechanism, an actuating device in the form of a jack

which bears at its opposite ends on a cross-beam of said lifting mechanism and on a cross-beam of said vertically extending framework for raising said lifting mechanism and for holding the latter in such raised position with respect to said carriage, and means for selectively moving said paired series of fingers in opposite directions only to the aforesaid positions.

4. In a drawer operating mechanism of the type which is adapted to be positioned directly in front of a drawer supporting structure having a series of superimposed sliding drawers therein each equipped with a pair of relatively widely spaced apart pulls and to be operatively connected to such drawers by raising of the mechanism to engage the same with pulls on the drawers so that movement of said mechanism in a direction away from the structure effects withdrawal of the drawers, the combination of a horizontally movable carriage including vertical members and cross-beams joining together said members, a drawer lifting mechanism vertically reciprocably mounted on said carriage, said mechanism comprising a pair of vertical bars and cross-beams joining together said bars, an actuating device in the form of a jack which bears at its opposite ends on a cross-beam of said lifting mechanism and on a cross-beam of said carriage for raising said mechanism and for holding the latter in such raised position with respect to said carriage, paired series of vertically spaced fingers respectively adapted to engage the pulls of the drawers, each pair of said series of fingers being vertically fixedly but independently horizontally swingably carried by said bars of said lifting mechanism whereby said fingers may be selectively swung between a position directly beneath the drawer pulls and a position laterally offset from the drawer pulls whereupon raising of said lifting mechanism engages only the fingers and pulls which are disposed directly above one another, and means for selectively swinging said paired series of fingers as aforesaid in opposite directions only to the aforesaid positions, each of said last-named means comprising a link pivotally connected to a cross-beam of said lifting mechanism, and a pair of oppositely extending rods having their ends connected to said link and to the respective pairs of said paired series of fingers at points outward of the respective pivot axes of said link and fingers, said fingers being prevented from swinging past the pull engaging position by said vertical members of said carriage.

CHARLES A. BARNETT.
CHARLES H. BARNETT.

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