No. 830,936. PATENTED SEPT. 11, 1906.

A. F. STAPLES & C. W. POTTER.

ACCOUNT REGISTER.

APPLICATION FILED JUNE 18, 1906.

3 SHEETS—SHEET 1.

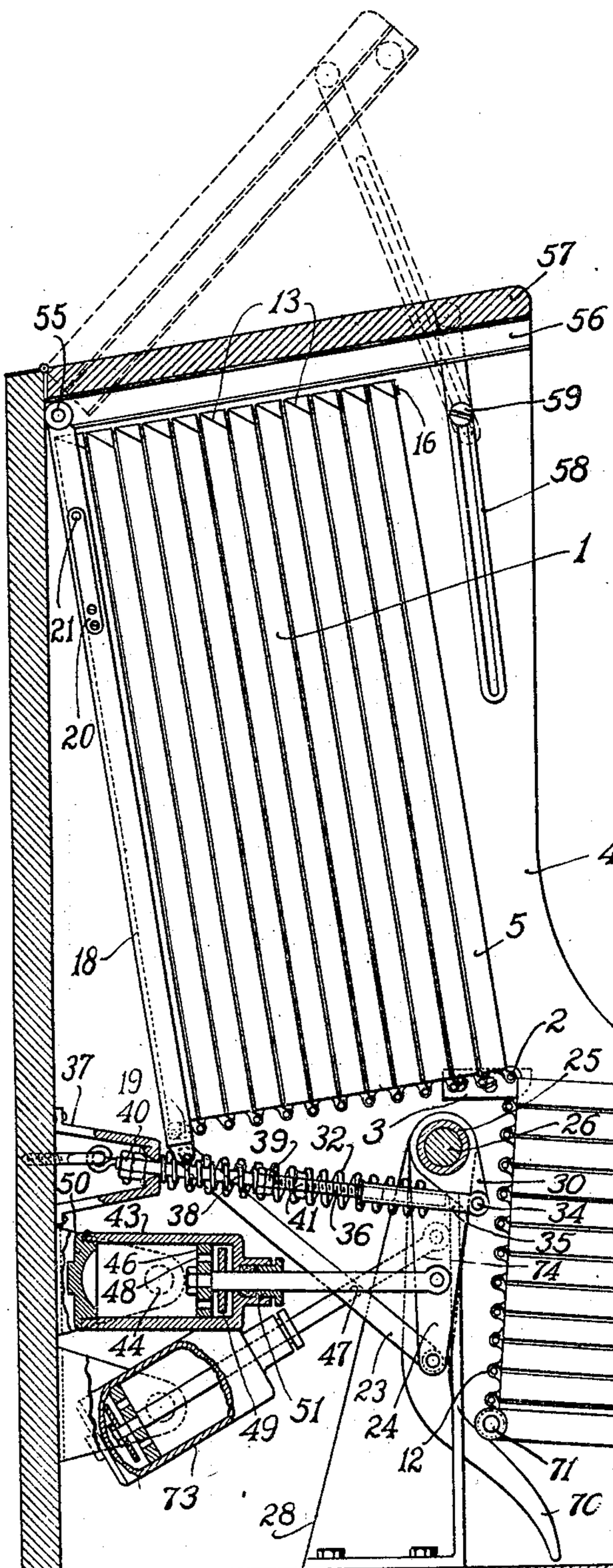

FIG. 1.

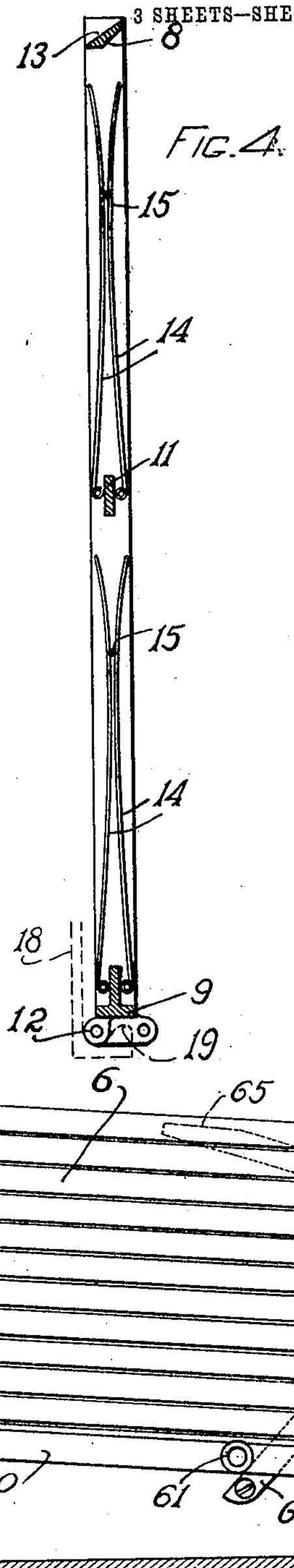

FIG. 4.

WITNESSES

Farnum F. Dorsey

Edward S. Doty

INVENTORS

Albert F. Staples

Charles W. Potter

by Their Attorneys

Phillips Van Emren & Fish

No. 830,936. PATENTED SEPT. 11, 1906.

A. F. STAPLES & C. W. POTTER.

ACCOUNT REGISTER.

APPLICATION FILED JUNE 18, 1906.

3 SHEETS—SHEET 2.

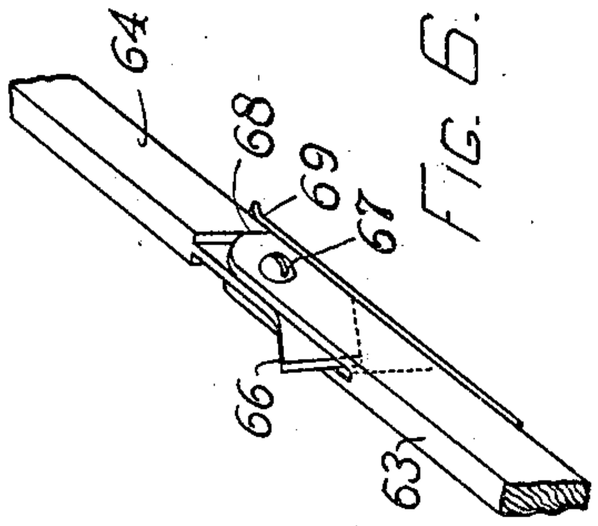

FIG. 6.

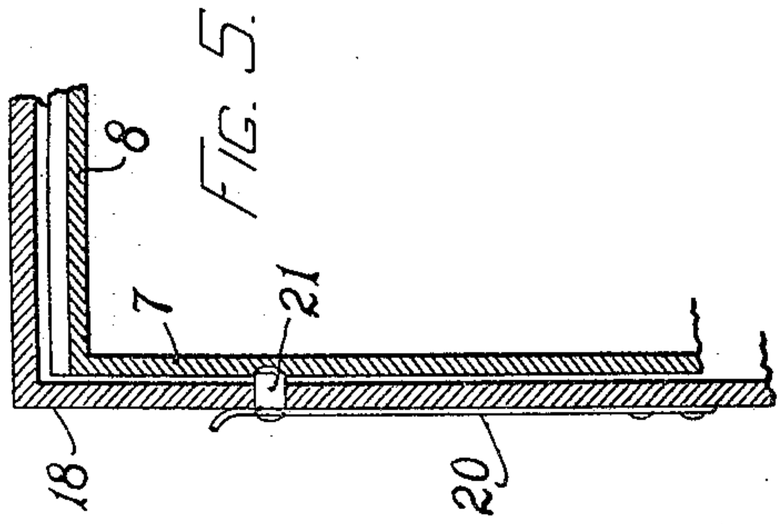

FIG. 5.

FIG. 2.

WITNESSES

Farnum F. Dorsey

Edward S. Day

INVENTORS

Albert F. Staples

Charles W. Potter

by their Attorneys

Phillips Van Emmon & Fish

No. 830,936. PATENTED SEPT. 11, 1906.

A. F. STAPLES & C. W. POTTER.

ACCOUNT REGISTER.

APPLICATION FILED JUNE 18, 1906.

3 SHEETS—SHEET 3.

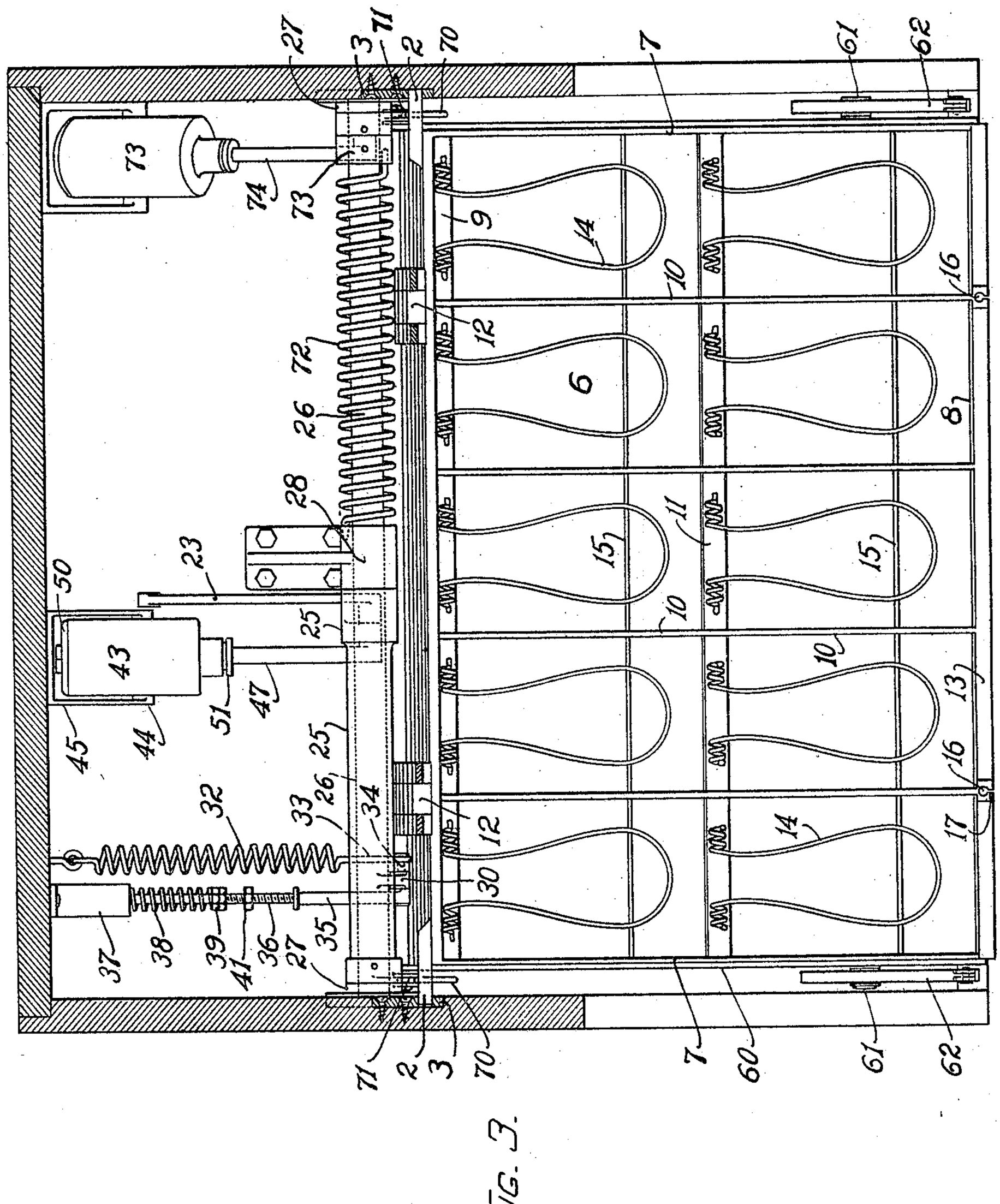

FIG. 3.

WITNESSES

Vernum F. Dorsey

Edward S. Dorsey

INVENTORS

Albert F. Staples

Charles W. Potter

by their Attorneys

Philips Van Vernum & Fish

UNITED STATES PATENT OFFICE.

ALBERT F. STAPLES, OF DORCHESTER, AND CHARLES W. POTTER, OF WALTHAM, MASSACHUSETTS.

ACCOUNT-REGISTER.

No. 830,936. Specification of Letters Patent. Patented Sept. 11, 1906.

Application filed June 18, 1906. Serial No. 322,153.

To all whom it may concern:

Be it known that we, ALBERT F. STAPLES, residing at Dorchester, in the county of Suffolk, and CHARLES W. POTTER, residing at Waltham, in the county of Middlesex, State of Massachusetts, citizens of the United States, have invented certain new and useful Improvements in Account-Registers; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to improvements in account-registers.

The object of the invention is to improve the construction and operation of account-registers of the type in which a number of frames carrying bill-clips are pivotally mounted so as to be opened and closed like the leaves of a book, particularly to produce a device of this character in which a large number of frames is contained and conveniently operated in a comparatively small space; and to this end the invention consists in an account-register embodying the improvements in the construction of the frames and the construction and operation of their supporting and operating devices hereinafter set forth in connection with the description of the illustrated embodiment of the invention.

The invention in its illustrated embodiment is an improvement on the account-register described in the copending application of ourselves, filed February 26, 1906, Serial No. 302,879.

In the drawings, Figure 1 is a vertical section of an improved account-register embodying the present invention, showing the device in closed position. Fig. 2 is a similar view in which part of the normally horizontal leaves are raised. Fig. 3 is a sectional plan view of the lower portion of the register. Fig. 4 is a vertical section of one of the bill-holder frames. Fig. 5 is a detail sectional view showing one of the catches for securing the bill-holder frames to the upright carrying-frame. Fig. 6 is a perspective view of one of the joints in the inclined guides for the horizontal carrying-frame.

In the application above referred to was described an account-register comprising a number of pivotally-mounted frames carrying bill-holders, these frames being arranged normally in an upright group and being swung downward and forward when in use. In the present invention a similar group of upright frames is used; but another group of frames having a normally prone or substantially horizontal position is combined with the group of upright frames, the arrangement being such that without substantial increase in the space required for the register the capacity of the register is doubled. The illustrated embodiment of the invention also embodies certain improvements in the construction of the frames and of the mechanism by which the movements of the normally upright frames are controlled in the said application, together with mechanism for controlling the movements of the horizontal frames.

The normally upright frames are arranged in a group 1, as shown in Fig. 1, hinged together in a series at their lower edges and pivoted in lugs 3 in the sides of the casing 4 of the register. The frames are pivoted by means of projecting pivots 2, fixed to the foremost frame 5 of the upright group. These pivots rest loosely in notches in the lugs 3, so that the pivots may be removed from the lugs when it is desired to remove the frames from the casing. The normally horizontal frames are arranged in a group 6, Fig. 1, similarly hinged together and connected with the group 1, so as to be supported by the same pivots 2.

The bill-holder frames consist each of an open framework comprising side members 7, top and bottom members 8 and 9, and vertical and horizontal cross-bars 10 and 11, respectively. The bottom members 9 are provided with hinge-butts forming the hinges 12, by which the frames are connected. The top members 8 are beveled, so as to provide inclined surfaces 13 presented toward the operator of the register, and upon these surfaces are placed index characters to distinguish the frames, so that in looking up an account in the register the proper frame may be readily ascertained. These beveled surfaces are oppositely disposed in the two groups of frames, as shown in Fig. 4, and they also provide convenient provision for grasping the free edges of the frames in order to draw down the upright frames or raise the

horizontal frames. The horizontal cross-bars 11 and the bottom members 9 are provided with spring-wire bill-clips 14, which are arranged in pairs on opposite sides of the bars, the bills held by the opposite clips being separated by cross-wires 15, fixed in the frames, as shown in Figs. 3 and 4. To prevent concussion between the frames when they are moved, elastic buffers 16 are inserted in each leaf. These buffers consist of plugs of rubber or other elastic material extending through openings in the edges of the frames and projecting slightly at either end. The buffers are conveniently inserted through slits 17, cut through the edges of the frames into the holes in which the buffers are located.

The means for facilitating or controlling the movements of the upright group of frames 1 are in general somewhat similar to those described in the application above referred to; but the motion-controlling devices are not directly connected to the last frame of the group, but are connected to an independent member 18, which may be called for convenience the "upright" carrying-frame. This frame is provided with a recess in which the last of the group 1 fits, as shown in dotted lines, Fig. 1, and the bill-holder frame is held therein at its lower edge by the engagement with the carrying-frame of the lugs 19, corresponding in position to the hinge-butts, and at its upper edge by spring-pressed detents comprising springs 20, fixed at their lower ends to the sides of the carrying-frame 18 and provided at their upper ends with pins 21, passing loosely through holes in the carrying-frame and engaging at their inner ends recesses in the bill-holder frame. To the bottom of the carrying-frame 18 is pivoted a link 23, which is pivoted at its other end to a depending arm 24, integral with a sleeve 25, journaled upon a rock-shaft 26. The rock-shaft is journaled at its ends in bearings 27, fixed to the sides of the casing, and passes at its middle portion through a standard 28, rising from the bottom of the casing. The sleeve 25 has a normally depending arm 30, to which are connected springs for controlling the movement of the frame. In the previous application referred to was described a construction in which springs were used only to partly counterbalance the weight of the frames when in the normal upright position and to assist the operation of drawing the frames forward. It has been found, however, that in account-registers of various sizes and weights the requirements of the motion-controlling mechanism vary, it being sometimes desirable to provide means acting after most of the upright frames have been drawn down to resist rather than to assist the movement of the remaining frames in order to prevent such frames from being accidentally lowered. To this end in the illustrated machine the counterbalancing-spring acts when the frames of the upright group are all in the upright position to counterbalance their weight and assist in moving them forward and down and is arranged to lose its effectiveness and cease to operate after a portion or the greater part of the frames have been drawn down, and a supplementary spring having an opposite effect is arranged to come into operation at such time and acts to retain the remaining frames in upright position.

The counterbalancing-spring 32 is adjustably secured at its rear end to the back of the casing, and its forward end is provided with an elongated eye 33, engaging the grooved end of a stud 34 in the lower end of the arm 30. When the upright frames are in their normal position, the spring 33 is maintained under tension by the arm 30 and tends to rotate the sleeve 25 and the arm 24 in a direction to press upwardly, through link 23, upon the upright carrying-frame 18, so as to partly counterbalance the weight of the upright frames. As the forward frames of the group are turned down, however, the carrying-frame rises with the rearmost frame and the sleeve 25 turns until the arm 30 by its rearward movement permits the counterbalancing-spring 32 to close, so that it ceases to operate, and thereafter the stud 34 merely moves idly in the eye 33 on the spring. The other end of the stud 34 is connected, however, with a sleeve 35, sliding upon the end of a threaded rod 36, which loosely enters the sleeve 35 at one end and passes loosely at its other end through an opening in a yoke 37, fixed to the back of the casing. A compression-spring 38 engages the yoke at one end and at its other end engages adjusting-nuts 39, threaded upon the rod 36. Stop-nuts 40 on the rear end of the rod 36 limits the movement of the rod 36 under the influence of the compression-spring 38. An adjusting-nut 41 on the rod 36 is in position to be engaged by the end of the sleeve 35 during the latter part of the rear movement of the arm 30. This construction operates to resist the rearward movement of the arm 30 by engagement of the sleeve 35 with the nut 41 and the consequent movement of the rod 36 and compression of the spring 38 at or about the time when the operation of the counterbalancing spring 30 ceases, and thus the compression-spring 38 and its connecting mechanism operate to resist somewhat the forward and downward movement of the remaining upright frames.

To prevent the upright frames from being drawn down too suddenly and slamming against the horizontal frames, a checking device is connected with the arm 24. This device comprises a cylinder 43, pivoted at 44 in a yoke 45, fixed to the back of the casing. Within the cylinder is a piston 46, connected by means of a piston-rod 47 with the arm 24.

The piston is provided with openings 48 and a check-valve 49, which moves freely toward and from the forward side of the piston, so as to close or unclose the openings 48. Glycerin or other suitable fluid is contained in the cylinder 43, being retained therein by a head 50, screwed in the rear end of the cylinder, and by a stuffing-box 51, which prevents leakage along the piston-rod. This check device is moved freely, owing to the action of the valve 49, during the first part of the rearward-swinging motion of the arm 24, the piston at such time moving toward the rear end of the cylinder 43; but after the arm 24 passes the position in which it is in line with the piston-rod and continues to swing upwardly the direction of the piston is reversed, the valve 49 closes, and forward movement of the piston is resisted by the fluid in the cylinder, and the checking device therefor operates to retard the last part of the downward movement of the frame. This device does not operate when the foremost one of the frames is turned forward or when only a small number are so operated. The checking device operates also to prevent slamming of the frames when they are returned from their horizontal to their upright position, such action occurring as the arm 24 swings forward toward the position of Figs. 2 and 4.

The upper end of the carrying-frame 18 is provided with guide-rolls 55, journaled at the corners of the frame and engaging flanged guides 56, fixed to the cover 57 of the casing. The cover is hinged at its rear edge and is swung upward when the register is in use to the position shown in dotted lines, Fig. 1, being retained in such position by slotted links 58, pivoted at their upper ends to the cover 57 and engaging screws 59 in the sides of the casing. The guides when thus swung upward are arranged at such an angle as to guide the upper end of the carrying-frame and the bill-frames and to cause them to move forward as the frames are turned forward and down, so that the foremost upright frame is always substantially at the same distance from the operator of the register. This arrangement is substantially like that described in the application above referred to, except that the inclined guides are provided, as shown in Fig. 1, with flanges engaging the rollers both above and below, so as to prevent displacement of the carrying-frame when the bill-holder frames are removed.

A horizontal carrying-frame 60 is provided to control the movement of the normally horizontal frames 6. This carrying-frame 60 is recessed to receive the lowermost of the horizontal bill-frames, as shown in dotted lines, Fig. 4. The forward end of the carrying-frame 60 is supported by guide-rolls 61, journaled on the sides of the forward part of the carrying-frame and engaging guides 62. The construction of the guides 62 is shown particularly in Figs. 2 and 6, these guides being arranged to fold automatically into the cabinet when not in use and extending in their operative position at an inclination of substantially forty-five degrees forward from the casing, so that as the horizontal frames are turned up and the inner ends of the lowermost frame and the carrying-frame 60 are thereby raised and moved forward the forward edges of these parts are caused to rise by the guide-rolls 61 running up on the guides, and thus the frames remaining horizontal are moved to positions substantially parallel to their original positions, and the uppermost of the frames remaining horizontal occupies always substantially the same vertical position. As shown in Figs. 2 and 6, the guides 62 each comprise a fixed portion 63, screwed to the side of the casing between the casing and the frames, a second member 64, jointed to the member 36 and a third member 65, jointed to the member 64. The member 64 is provided with a tongue 66, entering a slot in the end of the member 63, and pivoted therein upon a pivot 67. Shoulders 68 on the member 64 engage corresponding shoulders on the member 63 and limit the downward movement of the member 64 on the member 67, so as to hold the two members in line in the position of Fig. 2 when the guide-roll 61 rests upon the member 64 or the member 65. The member 64 may be swung upward and inward freely about the pivot 67 to assume the position of Fig. 1 when the guide is out of use. To cause the members 64 to be so folded in after the guide-rolls have passed down to the fixed members 63 as the normally horizontal frames are folded down to their normal position, the tongues 66 are provided with upward projections which project above the surface of the guide, so that the tongues are engaged by the rolls 61, and thereby depressed into the slots in the fixed members 63, causing the members 64 to be folded upward, as above described. Jackknife-springs 69, fixed to the fixed members 63, engage the lower surfaces of the tongues 66 and serve to retain the guides in either their extended or their folded positions. The members 65 are connected with the members 64 in a manner precisely similar to that in which the members 64 and 63 are connected. Owing to the above-described arrangement, there is no projection beyond the front of the casing when the normally horizontal frames are folded down, and the guides extend forward only in proportion as they are required to support the forwardly-projecting frames.

Means are provided for partly counterbalancing the weight of the normally horizontal frames in order to assist in raising

them and to maintain them in raised position, and a checking device is also provided to prevent the frames from slamming when they are returned from upright position to horizontal position. Upon the ends of the rock-shaft 26 are fixed two lifting-arms 70, bearing against rolls 71 on the inner corners of the horizontal carrying-frame 60. A coiled spring 72 (shown in Fig. 3) surrounds the rock-shaft 26. One end of the spring is fixed to the standard 28 and the other end is fixed to an adjustable collar 73 on the rock-shaft. This spring tends constantly to swing the lifting-arms 70 forward and upward, so as to assist in raising the inner ends of the horizontal carrying-frame and the horizontal bill-frames and also to maintain them in raised position when they have been swung up. The portions of the lifting-arms 70 engaged by the rolls 71 when all or nearly all of the horizontal frames are down are inclined, as shown in Fig. 1, so that the lifting-arms when in this position may have a lifting tendency upon the rolls 71 in order that when only one or a few of the horizontal frames are raised the lifting-arms, which at such times are in substantially vertical position, may still have sufficient lifting tendency to maintain the frames so turned up in their raised position.

The checking device 73 by which the motion of the normally horizontal frames is checked is substantially similar in construction and operation to the checking device for the vertical frames, except that it is arranged to act in the opposite direction, the check-valve, as shown in Fig. 1, being on the opposite side of the piston. The piston-rod 74 is pivotally connected with one of the lifting-arms 70, and the checking device operates when the arms 70 are swung downward and backward as the normally horizontal frames are lowered.

We are aware that previously both account-registers or files having normally vertical frames and similar devices having normally horizontal frames have been proposed; but it is new, so far as we are aware, to combine in one register frames of both classes in such a manner as to permit the free use of either group of frames, while the entire apparatus occupies substantially the place required for one group of frames alone. The use of open or skeleton frames for supporting the bill-clips in place of leaves or frames provided with continuous backs is also new, so far as we are aware, and conduces greatly to the utility of the device, since the frames so constructed are very light and easy to handle. This form of frame has a further advantage in that it allows the bills on one frame to encroach upon the spaces within the adjoining frames, so that when desirable a large bundle of bills may be placed in one clip, being permitted to project beyond the frame by which it is carried into the adjoining space without interfering with the proper operation of the device.

The invention is not limited to the details of construction and operation of the illustrated embodiment, but may be embodied in other forms broadly defined in the claims.

Having now described the invention, what is claimed is—

1. An account-register having, in combination, a plurality of frames hinged together, and a pivotal support for the frames connected with one of the intermediate frames, substantially as described.

2. An account-register having, in combination, a plurality of frames pivotally mounted and arranged in two groups of which one occupies normally a horizontal position and the other normally an upright position, the pivotal supports of the two groups being adjacent to each other, substantially as described.

3. An account-register having, in combination, a plurality of normally horizontal frames hinged together, a plurality of normally upright frames hinged together, and a common pivotal support for the hinged edges of the two groups of frames, substantially as described.

4. An account-register having, in combination, a plurality of frames hinged together and occupying normally a horizontal position, a plurality of frames hinged together and occupying normally an upright position, and pivotal supports for the uppermost horizontal frame and the foremost upright frame, substantially as described.

5. An account-register having, in combination, a plurality of frames hinged together in series and occupying normally a horizontal position, a pivotal support for the uppermost frame, and means tending to raise and hold raised the hinged edges of the frames, substantially as described.

6. An account-register having, in combination, a plurality of frames hinged together and occupying normally a horizontal position, a pivotal support for the uppermost frame, means tending to raise and hold raised the hinged edges of the frames, and means acting, when some of the frames are swung upward about their hinges to raise the free ends of the frames remaining horizontal, substantially as described.

7. An account-register having, in combination, a plurality of movable frames hinged together, a support for the hinged edges of the frames, and an extensible guide for the free edges of the frames, substantially as described.

8. An account-register having, in combination, a plurality of movable frames hinged together, a support for the hinged edges of the frames, and a jointed folding guide for the free edges of the frames, substantially as described.

9. An account-register comprising a plurality of open or skeleton frames provided

with bill-holding spaces opening into each other so that the bills of one space may project into an adjoining space and bill-clips mounted on the frame for holding the bills in the bill-holding spaces, substantially as described.

10. An account-register having, in combination, a plurality of normally upright frames hinged together at the bottom, pivotal supports for the frames, inclined guides provided with retaining-flanges, and means connected with one of the frames near its upper edge engaging said guides, substantially as described.

11. An account-register having, in combination, a plurality of operatively-connected bill-holder frames, a carrying-frame engaging one of the bill-holder frames, and guiding means for causing the carrying-frame to rise horizontally, substantially as described.

12. An account-register having, in combination, a plurality of bill-holder frames hinged together in series, pivotal supports for one frame, a carrying-frame detachably connected with one terminal frame of the series, and means for guiding and controlling the movements of the carrying-frame, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

ALBERT F. STAPLES.
CHARLES W. POTTER.

Witnesses:
HORACE VAN EVEREN,
FARNUM F. DORSEY.