Nov. 4, 1958 F. K. DEVLIN ET AL 2,859,083

TRAY ELEVATING DEVICE

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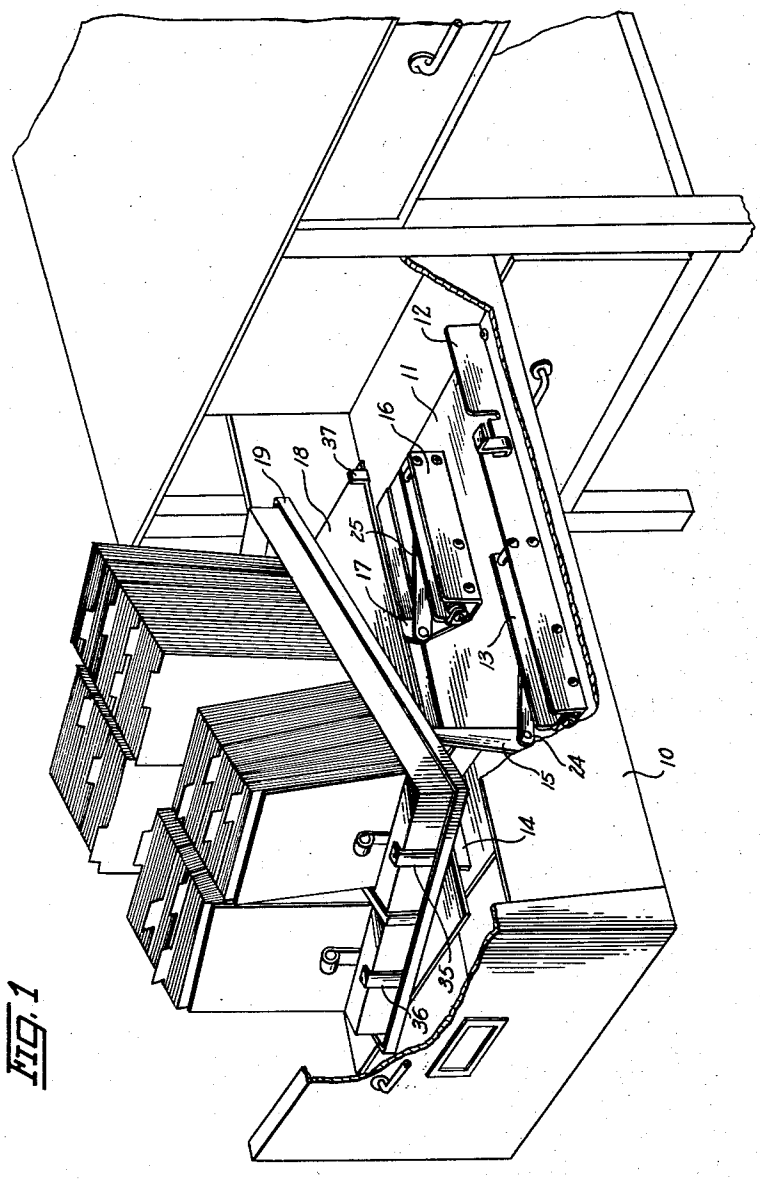


FIG. 1

INVENTORS.
FRANK K. DEVLIN
HENRY J. SIEMON
BY Flournoy Corey
ATTORNEY.

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FIG. 2

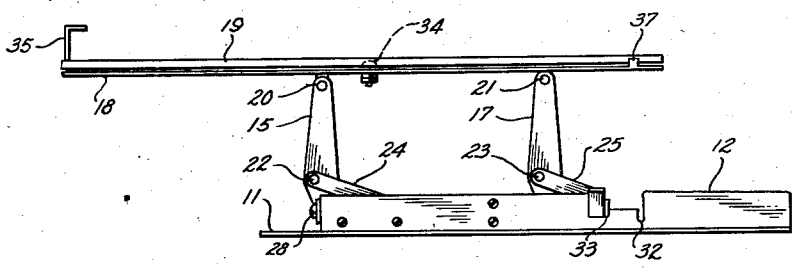


FIG. 3

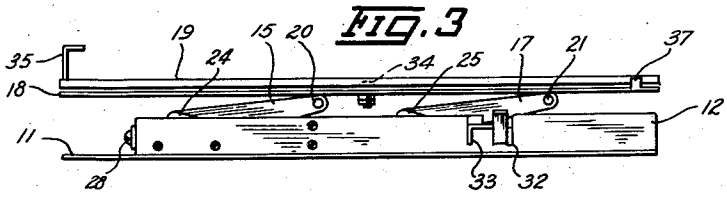


FIG. 4

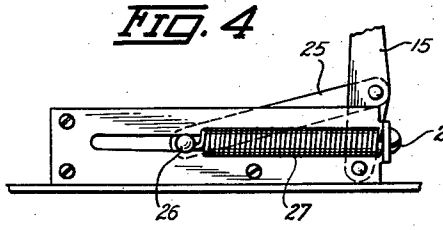
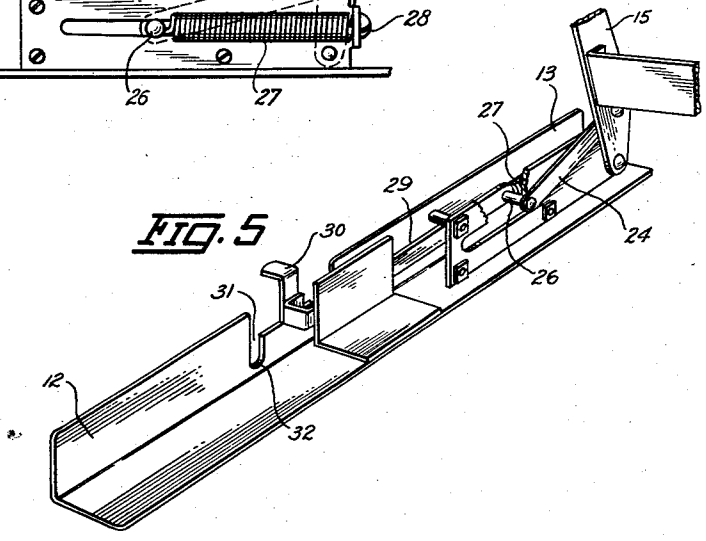


FIG. 5



INVENTORS.
FRANK K. DEVLIN
HENRY J. SIEMON
BY Flournoy Corey
ATTORNEY.

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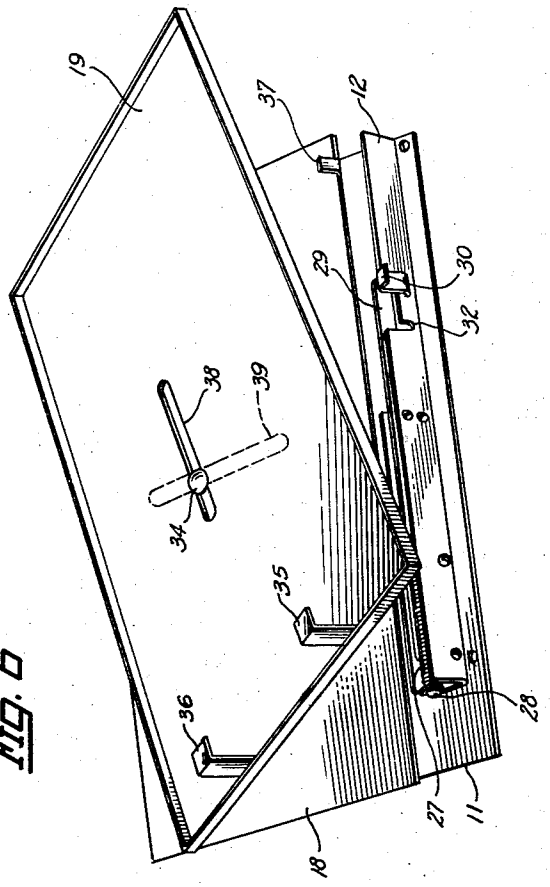


Fig. 6

INVENTORS.
FRANK K. DEVLIN
HENRY J. SIEMON
BY Flournoy Corey.
ATTORNEY.

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TRAY ELEVATING DEVICE

Frank K. Devlin and Henry J. Siemon, New York, N. Y., assignors to Le Febure Corporation, Cedar Rapids, Iowa, a corporation of Iowa

Application February 15, 1955, Serial No. 488,351

4 Claims. (Cl. 312—298)

This invention relates to a tray elevating device and has particular reference to a counterbalanced device which may be mounted in a desk drawer and which is adapted to be raised and lowered at will.

As the art and volume of business procedures has advanced, it has become more and more desirable to maintain readily accessible control records which are constantly available to the individual. The mere mechanics of handling such records have become an increasing problem. Numerous special bookkeeping desks, files and stands of various types have been invented to meet these problems. The records themselves have become more complex. For example, individual account records have been expanded to a point where they contain not only the outstanding balance which the customer may owe, but a complete credit record pertaining to the individual and his business dealings with others. Such records must be immediately available to credit department personnel and some protection must be afforded such records. It therefore becomes advisable to devise means whereby such records may be stored in a desk when not required, and yet readily available when needed.

It is therefore a primary object of our invention to provide a tray elevating device which can be mounted in a desk drawer in such a manner that it may be collapsed so that the drawer may be closed, and yet elevated at will so that the operator may work with the file material.

It is another object of our invention to provide a tray elevating device which may be turned in all directions so that it may be positioned at the most convenient angle.

It is still another object of our invention to provide a device in which the tray member can be firmly locked in either the upper or lowered position.

It is yet another object of our invention to provide a device in which the tray portion is counterbalanced to permit effortless movement either up or down.

Other and further features and objects of the invention will be more apparent to those skilled in the art upon a consideration of the accompanying drawings and following specifications, wherein is disclosed a single exemplary embodiment of the invention with the understanding, however, that such changes may be made therein as fall within the scope of the appended claims, without departing from the spirit of the invention.

In said drawings:

Figure 1 is a view in perspective of the tray elevating device constructed according to our invention, the device being mounted in a desk drawer.

Figure 2 is a side view of the device in an elevated position.

Figure 3 is a side view of the device in a lowered position.

Figure 4 is a view in detail of the counterbalance spring and the slide member in which it operates.

Figure 5 is a view in perspective of the locking member and its connection to the counterbalance mechanism, and

Figure 6 is a view in perspective showing the device in the lowered position, and is particularly intended to show the slot means by which wide adjustment may be obtained.

Referring now to the drawings, and particularly to Figure 1 wherein a device constructed according to our invention is shown mounted in a desk drawer, we will now describe our invention.

Fastened to the bottom of the desk drawer **10** is a base plate **11** which has two parallel rail members, one of which is shown at **12**. Attached to the forward ends of these rail members are secondary parallel plates **13** and **14** which form a U-shaped assembly. These rails and secondary plates serve to hold the counterbalanced lifting arm, such as is shown at **15**.

A third U-shaped support point is provided at a position midway between these two rails and rearwardly of the forward supports at **16**, and is similarly constructed of a rail and secondary plate which supports an elevating arm **17**.

Mounted on the three elevating arms is a shelf member **18** which in turn has pivoted thereto a tray **19** which is adapted to hold the base of one or more standard file drawers.

It will be readily apparent that the length of the elevating levers **15** and **17** might be varied in proportion to the depth of the drawer in which the device is to be used, and that whatever dimension is selected will be the distance through which the tray can be elevated. The desired purpose will be to select the distance which will bring the contents of the file drawers up to a convenient working level which would be substantially the same as that of the height of the desk top.

Referring now to Figures 2 and 3: the nature of the elevating arms is shown in greater detail. The arms are preferably triangular in shape, the lower end of each being pivotally mounted on the secondary plate adjacent the base rail. The other ends of the elevating arms are pivotally mounted at **20** and **21** to the shelf **19**. The counterbalance mechanism is attached to these arms at a point one-quarter to one-third the distance thereof above the pivotal connection to the secondary plate. These connections are shown at **22** and **23**. It will also be noted that they are mounted pivotally at the forward corner of the triangle of which the elevating arms are formed. The purpose of this mounting is to bring the pivotal point over center when the arms are raised. The counterbalance mechanism comprises two rearwardly extending arms **24** and **25** which are slidably mounted at their opposite ends in the secondary plate, as at **26** shown in Figure 4.

A spring member **27** extends forwardly from the mounting point **26** to the end of the secondary plate where it is fastened by an adjusting screw **28**. This spring member is adapted to be expanded as the elevating arms are lowered, and therefore serve to counterbalance the downward movement of the tray. It will be noted that the extent of movement of this spring member is very limited, which permits a relatively heavy spring to be used through a short operative range.

To lock the elevating arm in the lowered or raised position, we have provided a latching mechanism such as is shown in Figure 5. Attached to the pivotal mounting sleeve **26** which carries the lever **24**, is a slidable bar **29** which has in its outer end the latch member **30**. To receive this latch member, we have provided an opening **31** which is cut in the rail member **12**. At each end of this opening portion are slots **32** and **33**. The latch portion of the slidable member is positioned to engage either of these slots, depending upon whether the tray is at its lowered or raised position.

To obtain the circular movement of the tray, we

have provided a pivotal mounting bolt **34** which is positioned in the center of the tray and fastened to the center point of the shelf.

In addition to circular movement of the upper tray, we have also provided means whereby the tray may also be moved from side to side and backward and forward in relation to the shelf member. This means comprises two slots. The upper slot **38** is in the tray member **19** for a short length along the length of the tray. The lower slot **39**, shown in dotted lines, is on the shelf and extends for a short distance from side to side. Obviously these two slots cooperate to permit the tray to be moved from side to side and backward and forward to any desired position within the length of these slots.

From a consideration of the foregoing description, the operation of the device is apparent. By movement of the latch member **30**, the shelf and tray may be moved up and down through a considerable distance. The counterbalance mechanism which is present in all three supports, serves to carry the greater share of the load which would be present when the file drawers were in position in the tray.

The latching mechanism may be engaged at either end of the slot to hold the tray in a firm position against either the weight of the file drawers or the action of the counterbalance springs.

The tray may be rotated throughout 360 degrees. However, to position the tray for lowering into the desk drawer, a stop member **37** has been provided and is mounted on the shelf, and to hold the file draws in a firm position, a pair of L-shaped members **35** and **36** are attached to the tray and adapted to fit over the base of the file drawers.

Although we have described a specific embodiment of our invention, it is apparent that modifications thereof may be made by those skilled in the art. Such modifications may be made without departing from the spirit and scope of our invention as set forth in the appended claims.

We claim as our invention:

1. In a tray elevating device in combination, a base member a plurality of triangular elevating arms pivotally mounted on said base member, a shelf pivotally mounted on the upper ends of said elevating members, counterbalance members including spring bias linking means operatively connected at a point forwardly and intermediate of the aforesaid base and shelf pivotal mountings to each of said elevating members and said base member and extending rearwardly in the same plane thereof, and a locking means operatively connecting one of said elevating members and said base member.

2. In a device of the type described in combination, a base plate, a plurality of elevating arms mounted on said base plate, a shelf member mounted on the upper

end of said arm members, a revolving tray mounted on said shelf member, a counterbalance means including a spring bias lever means, one end thereof being positioned in an off-center relation on and adapted to bias said elevating arms in an upwardly and over center direction, said means extending substantially longitudinally of said base member, and a slide member operatively connected to one of said elevating arms and adapted to lock said elevating member in a raised or lowered position at will.

3. In a device of the type described, a base plate having a pair of parallel rail members mounted on the outer edge thereof, a pair of secondary plates mounted inwardly therefrom and at one end of said rail, a third rail and secondary plate positioned between said outer rails and rearwardly of said first mentioned secondary plate assembly, a triangular-shaped elevating arm mounted in each of said secondary plates, a lever arm pivotally attached to and extending rearwardly from said elevating arms said attachment being at the forwardmost portion thereof, said lever arm being slidably mounted in said secondary plates, spring means longitudinally adjacent said rail members, and adapted to bias said lever arms forwardly against said elevating arms into an over-center relation therewith, a tray member pivotally mounted on the upper ends of said elevating arms, and a slidable latch means adapted to engage one of said rails and elevating arms at either extreme point of their movement.

4. In a device of the type described, a base plate having a plurality of triangular shaped elevator arms pivotally mounted on said base plate, a shelf pivotally mounted on the upper end of said arms, and counterbalanced lever means positioned longitudinally of said base plate and adapted to elevate said lever arms at will, said lever arms being pivotally attached to said elevator arms forwardly and intermediate of the aforesaid base and shelf pivotal mounting to permit an over-center relationship therebetween, the tray having a slot extending for a portion of the length thereof, and the shelf having a corresponding slot extending for a portion of the width thereof, said pivotal mounting being positioned to engage both of said slots so that said tray may be moved in a plurality of directions in reference to said shelf.

References Cited in the file of this patent

UNITED STATES PATENTS

544,821	Morrison	Aug. 20, 1895
1,824,822	Kradolfer	Sept. 29, 1931
1,934,370	Mirabella	Nov. 7, 1933
2,161,323	Stephenson	June 6, 1939
2,293,496	Egger	Aug. 18, 1942
2,531,140	Linde	Nov. 21, 1950
2,590,341	Nabhozz	Mar. 25, 1952