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1,933,933

DISAPPEARING TYPEWRITER CARRIER

Filed Jan. 13, 1932

2 Sheets-Sheet 1

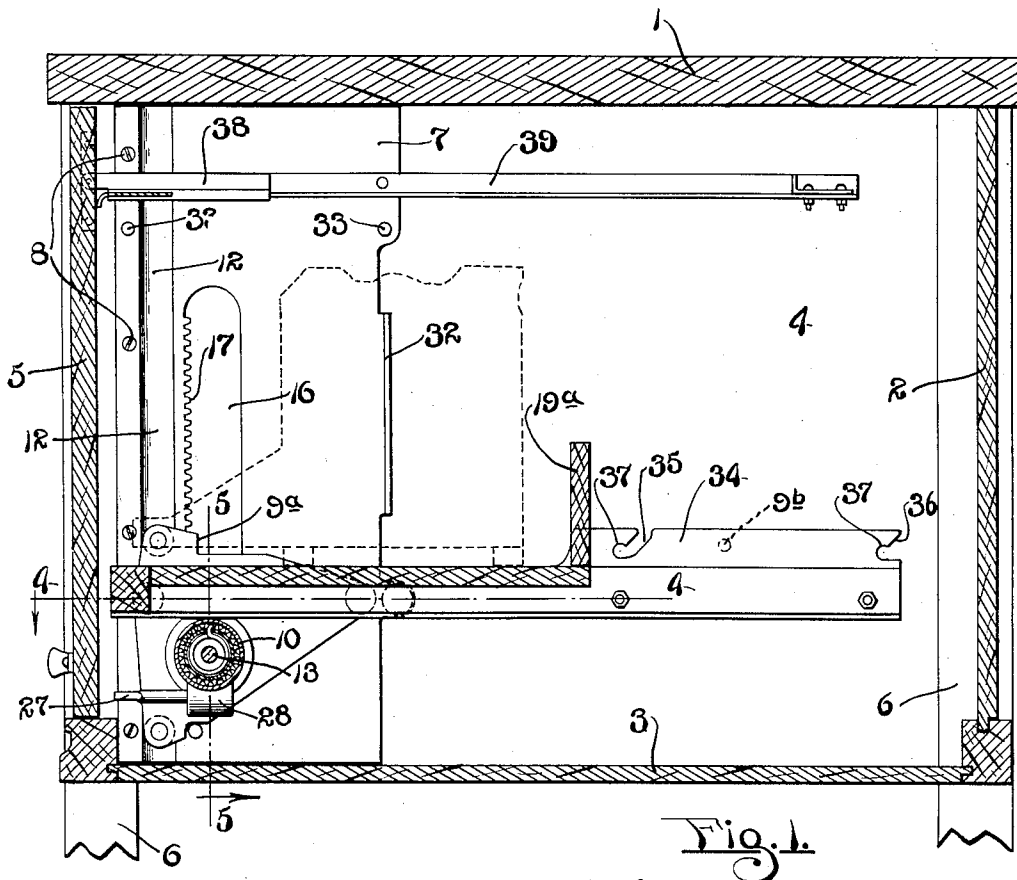


Fig. 1.

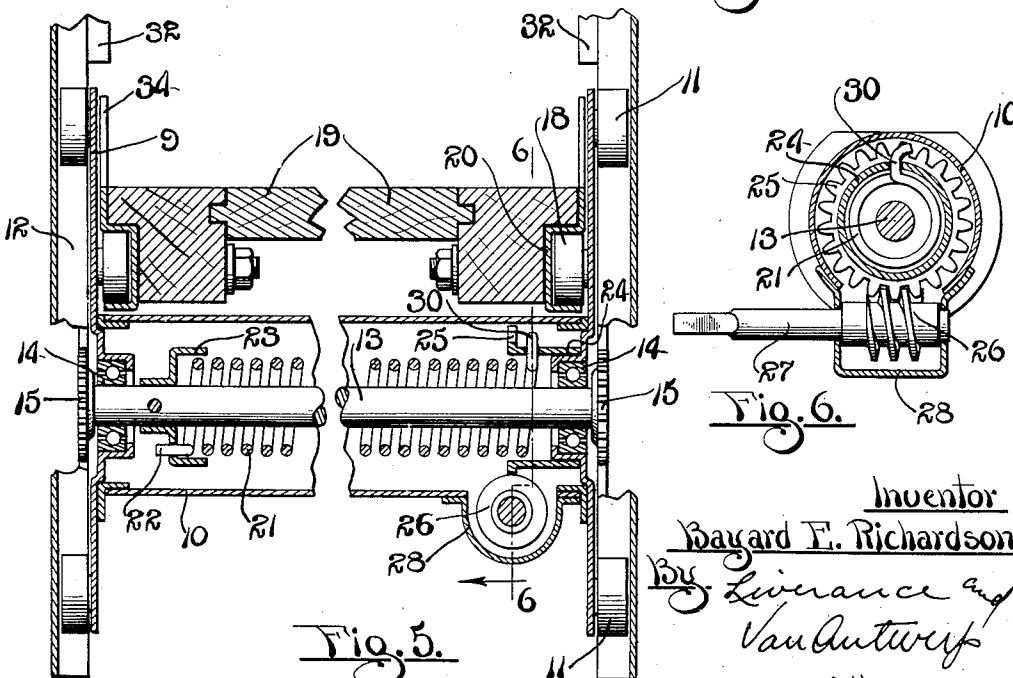


Fig. 5.

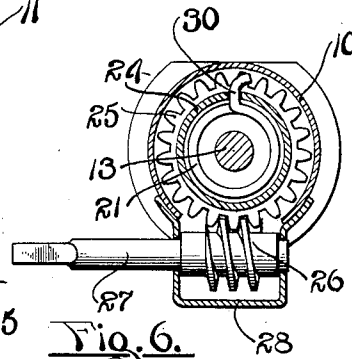


Fig. 6.

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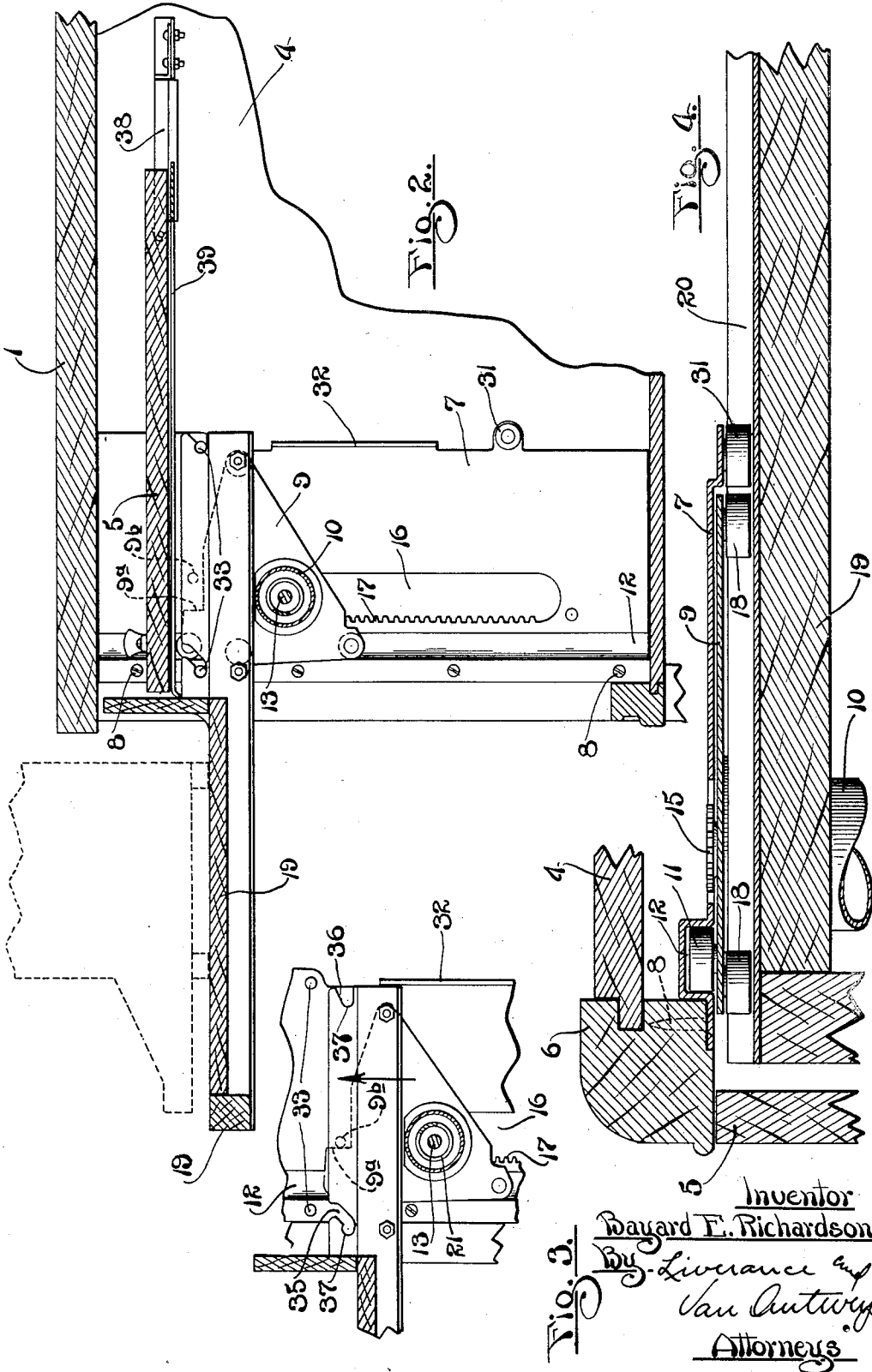
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UNITED STATES PATENT OFFICE

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DISAPPEARING TYPEWRITER CARRIER

Bayard E. Richardson, Grand Rapids, Mich.

Application January 13, 1932. Serial No. 586,347

13 Claims. (Cl. 312—29)

This invention relates to typewriter carriers of the type used in stenographers' desks for the purpose of supporting a typewriter in operative position and for carrying the typewriter to a concealed location within the desk.

The objects of the invention are to provide a device which will operate freely with little exertion by the user in moving it from one of its positions to the other. A further object of the invention is to provide means for rigidly supporting the device with a typewriter thereon in its extended operative position. A further object of the invention is to provide means for accurately guiding the carrier in its movements from one position to the other. A further object of the invention is to provide a structure which is extremely rigid and which may be quickly and accurately placed in a desk built to receive it.

The invention provides various other novel features of construction and arrangement as hereinafter more fully described and particularly pointed out in the claims, reference being had to the accompanying drawings, in which,

Fig. 1 is a sectional elevation of a desk with the typewriter carrier embodying this invention located therein in concealed position.

Fig. 2 is the same with parts broken away showing the typewriter carrier extended to operative position of the typewriter.

Fig. 3 is a fragmentary elevation of the parts shown in Fig. 2 showing a portion of the typewriter carrier approaching its uppermost and extended position.

Fig. 4 is an enlarged fragmentary plan view of portions of the carrier and desk taken along the line 4—4 of Fig. 1.

Fig. 5 is an enlarged fragmentary transverse sectional elevation with the center portion removed, of the typewriter carrier structure taken on the line 5—5 of Fig. 1, and

Fig. 6 is an enlarged section of the spring adjusting device taken on the line 6—6 of Fig. 5.

Like reference characters refer to like parts in the different figures of the drawings.

That portion of the desk in which the typewriter carrier is located has a top 1, a back 2, a bottom 3, sides 4 and an open front which is provided with a door 5. The desk structure shown has conventional corner posts 6.

The carrier structure has two main side plates 7 located adjacent opposite sides 4 of the desk and rigidly attached thereto or to the post 6 by means of screws 8. Two spaced apart brackets 9 are located each adjacent a plate 7 and are

rigidly joined by a tubular cross member 10 which cross member is fastened at its ends to the plates in a suitable manner as by welding. The brackets 9, joined by the cross member 10, constitute a vertically movable structure upon which the typewriter carriage is mounted for horizontal movement. Each of the brackets 9 is provided on its outer surface and near its forward edge with two vertically spaced apart guide rollers 11 which traverse tracks formed by grooves 12 formed in the respective plates 7 which guide the structure in its vertical movements.

The respective brackets 9 are caused to move equally and in unison by an equalizing mechanism which comprises a shaft 13 extending longitudinally through the tube 10 and having bearings 14 near its respective ends on the brackets 9, the respective ends of the shaft 13 projecting through the brackets 9 and being provided with pinions 15 rigidly fastened thereto. Each of the plates 7 is provided with a vertical slot 16, one edge of which has rack teeth 17 and the pinions 14 lie within the slots 16 and mesh with the rack teeth 17. It will be seen that this structure will cause the brackets 9 to move in unison and thereby insure the correct vertical movement of the structure.

Each of the brackets 9 is provided on its inner surface with two horizontally spaced apart rollers 18 and the bed 19 of the typewriter carriage has channel members 20 fixed to its respective horizontal edges which receive and are traversed by the rollers 18. This structure provides a horizontal sliding mounting of the typewriter carriage upon the brackets 9, the rollers 18 traveling in the channels 20 serving to transversely support the carriage in any of its positions. The stop pin 9b projecting from the side of the carriage structure engages a shoulder 9a on a bracket 9 to limit the forward movement of the carriage.

A counterbalance spring in the nature of a coiled torsion spring 21 surrounds the shaft 13 and preferably extends approximately the whole length thereof and is attached at one end to the shaft by having its end 22 inserted in an opening in a collar 23 which is fixed to the shaft. At the opposite end of the shaft a sleeve 24 is mounted for rotation on the adjacent bracket 9 preferably by surrounding the exterior of the socket in which the shaft bearing 14 is located. The sleeve 24 has an outturned flange which is cut with gear teeth 25 and a worm or screw 26 meshes with said teeth 25 and is provided with a short shaft 27 having bearings in a pocket

member 28 which is attached to the tube 10. One end of the shaft 27 extends outside of said pocket and terminates in a square shape which may receive a key for manual rotation. The end 30 of the spring 21 opposite the end 22 is fastened to the sleeve 24 by being inserted through an opening therein.

It will be seen that rotation of the shaft 13 caused by vertical movement of the carriage structure will twist the spring 21 and that tension of said spring may be utilized to aid in lifting the carriage structure and that adjustment of the tension of the spring may be had by rotating the sleeve 24 by means of the worm 26 and gear teeth 25 so that the spring may be tensioned sufficiently to counterbalance the weight of the carriage and also a typewriter thereon.

Because of the fact that the spring 21 may be tensioned sufficiently to automatically elevate the carriage structure from its lower position it is desired to provide means for retaining the carriage lowered when it is moved inwardly and for that purpose a roller 31 is mounted on one or both of the side plates 7 in a position to enter the channel 20 when the carriage is moved inwardly at its lowest position and this roller 31 being mounted on the immovable plate 7 prevents the carriage from rising when the roller is in the channel.

Because of the fact that the typewriter mounted on the carriage extends upwardly a considerable distance and in fact substantially fills the opening in the desk structure it is necessary to have the carriage fully extended whereat the typewriter will be located completely outside the desk structure before it can be elevated and it must be maintained in this extended position during elevation to prevent striking the desk structure.

The roller 31 is located in a position to require the carriage to be moved forwardly its full extent before the channel 20 will leave the roller and be permitted to rise and an intumed vertical flange 32 is provided on one or both plates 7 in position to be engaged by the rear edge of the carriage during its upward movement to prevent the carriage moving inwardly at an intermediate upper location.

Regardless of the tendency of the spring 21 to elevate the carriage with the typewriter thereon, and in fact it is desirable to adjust the tension of the spring so that it will not fully elevate the carriage as hereafter explained, the carriage must have a rigid support when in its upper position in which the typewriter carried by it is used. Each of the side plates 7 is provided with two horizontal spaced pins 33 near their upper ends and the carriage is provided with upwardly extending flanges 34 near the rear end thereof, it being preferable to form the flanges integrally with the channels 20. The flanges 34 are provided with two recesses to receive the respective pins 33, the forward recess opening into the upper edge of the flange by means of an inclined slot 35 and the rear recess opening into the rear edge of the flange 34 by means of a slot having an inclined upper edge 36. Each of the recesses has a substantially horizontal portion 37 which receives the pins and supports the carriage when at rest.

The typewriter carriage structure as shown is composed of two side rails which extend the full length of the carriage, a bed member which

terminates substantially midway of the structure and a front cross rail, all of which members bear the reference numeral 19 and it is to be understood that the specific structure shown is not essential to this invention. An apron 19a may be provided at the rear edge of the bed portion and back of the typewriter to be located thereon which serves as a closure between the top of the desk and the bed when the carriage is elevated.

The door 5 is pivoted near the top and at its respective vertical edges on slides 38 which traverse tracks 39 extending horizontally within and near the top of the desk opening and the lower edge of the door may be swung outwardly to move the door to a horizontal position whereupon it may be retracted within the opening by sliding movement of the slides 38 on the track 39 and it will be supported in this horizontal retracted position by engagement of its side edges with the said track 39.

Operation

Assuming that the carriage with the typewriter located upon it is located within the desk opening as shown in Fig. 1 and that it is desired to move it to operative position, the door 5 is first opened as described by swinging it to a horizontal position and moving it into the opening. The typewriter and carriage are then manually moved forward in which movement the rollers 18 traverse the channels 20 and the roller 31 fixed to the plate 7 also being located in a channel 20 traverses the channel until the carriage has been moved its full extent in a horizontal direction whereupon the channel 20 is removed from the roller 31 and the effort of the spring 21 serves to automatically elevate the carriage and typewriter.

In the elevating movement the rear edge of the carriage structure engages the flanges 32 to prevent inadvertent rearward movement of the carriage. In this elevating movement the rollers 11 traverse the vertical grooves or tracks 12 in the plates 7 to guide the brackets 9 and the pinions 15 traverse the racks 17 causing rotation of the shaft 13 and equalizing the movement of the respective bracket 9. The torsion effort of the spring 21 serves, at least in the initial upward movement, to rotate the shaft 13 and to elevate the structure by action of the pinions 15 on the racks 17.

It is desirable that the tension of the spring 21 be so adjusted that its lifting effort will be equalized by the weight of the carriage and typewriter when they are somewhat below the limit of their upward movement. In other words, it is to be understood that the power of the spring decreases as it untwists and therefore it will have less lifting effort near the upper movement of the carriage than in its lower positions and it is desired that the tension be adjusted so that it will cease to lift the carriage and typewriter before the upper limit of movement has been reached. Completion of the upward movement is accomplished either by momentum of the parts or by a slight upwardly pull by the operator.

As the carriage nears the limit of its upward movement as shown in Fig. 3 the rear edge of the carriage structure passes the upper termination of the flange 32 and at approximately the same time the pins 33 enter the recesses in the flanges 34. The forward pin enters the inclined slot 35 and engages an edge thereof causing a

cam action which moves the carriage rearwardly as it rises until both of the pins are located in the substantially horizontal portions 37 of the recesses in which position the pins will rigidly support the carriage.

To lower and retract the carriage into the desk opening the operator pulls it forward to remove the pins 33 from the horizontal portions 37 of the recesses and the weight of the carriage and typewriter will cause an initial downward movement which downward movement is completed by manual effort of the operator, the carriage being prevented from moving rearwardly by the flanges 32 until it has reached its extreme lower portion at which it may be readily moved rearwardly to a location within the desk opening and such rearward movement causes the roller 31 to enter the channel 20 and retain the carriage in its lowered position.

It will be noticed that the shaft 27, carrying the screw 26 by means of which the tension of the spring is adjusted, is located most effectively for accessibility which is most important as the adjustable tension of the spring is very desirable for correct operation of the device. In the first place, the device is customarily displayed for sale without a typewriter upon it and the spring tension may readily be adjusted so that the carriage alone will operate for demonstrations in the same manner as it will operate when the weight of a typewriter is upon it. Furthermore, various typewriters differ considerably in weight and it is necessary that the spring be accurately adjusted to operate as previously described with relation to the weight of the typewriter which is supported upon the carriage. The spring should be adjusted so that it will raise the carriage with sufficient speed that its momentum will substantially complete its upward movement but at the same time the spring should not have sufficient tension to support the carriage at its extreme upper position because it is desired that weight of the carriage shall cause the initial downward movement when it is released from the supporting pins 33.

The tubular cross member 10 serves the dual purpose of an extremely rigid tie between the brackets 9 and a housing for the shaft 13 and spring 21 and its connecting parts. This structure both simplifies and cheapens the construction and at the same time materially adds to the appearance of the device inasmuch as the tubular member is conspicuous when the carriage is retracted. The device has few parts and all of them are comparatively simple and the installation of the mechanism in the typewriter desk is accomplished by mere attachment of the side plates 7 by means of the screws 8.

The invention is defined in the appended claims and is to be considered comprehensive of all forms of structure coming within their scope.

I claim:

1. A device of the class described comprising, two spaced apart side plates having vertical tracks, an elevating structure mounted for vertical movement on said tracks, a carriage mounted for horizontal movement on said elevating structure, and a vertical flange on one of said side plates engageable with the rear edge of said carriage when the carriage is horizontally extended and during upward movement of the elevating structure.

2. A device of the class described comprising, spaced apart side plates having vertical tracks,

an elevating structure mounted for vertical movement on said tracks, a carriage mounted for horizontal movement on said elevating structure, a fixed pin and means on said carriage structure engageable with said fixed pin acting to support the carriage structure in its extended and raised position, said carriage structure being movable vertically to cause disengagement of the pin.

3. A device of the class described comprising, two spaced apart vertical tracks, an elevating structure mounted for vertical movement on said tracks, a carriage mounted for horizontal movement on said elevating structure, said carriage having a slot and said slot having an inclined portion and a horizontal portion and a fixed pin acting to enter said inclined slot when the carriage is extended and near its upper location, said inclined slot acting upon said pin to move the carriage horizontally and enter the pin into the horizontal portion of said slot.

4. A device of the class described comprising, two vertical tracks, an elevating structure mounted for vertical movement on said tracks, a carriage mounted for horizontal movement on said elevating structure and having a slot with an inclined and a horizontal portion, means for retaining said carriage in its horizontally extended position during vertical movement of the elevating structure and a fixed pin positioned to enter the inclined portion of said slot when the carriage is near its upper location and to cause horizontal movement of the carriage to enter the pin into the horizontal portion of said slot, said retaining means releasing said carriage upon entry of said pin into said inclined portion of the slot.

5. A device of the class described comprising, two spaced apart vertical tracks, two side brackets, each located adjacent a respective vertical track and having guide means traversing said tracks, a tubular member extending between said brackets and rigidly joined to the brackets at its respective ends, a carriage mounted for horizontal movement on said brackets and counterbalancing means housed in said tubular member.

6. A device of the class described comprising, two spaced apart vertical tracks, two side brackets, each located adjacent a respective vertical track and having guide means traversing said tracks, a tubular member extending between said brackets and rigidly joined to the brackets at its respective ends, and an equalizing device comprising a shaft rotatably extending through said tubular member and having means at its respective ends coacting with fixed means serving to cause equal vertical movements of said brackets.

7. A device of the class described comprising, two spaced apart vertical tracks, two side brackets, each located adjacent a respective vertical track and having guide means traversing said tracks, a tubular member extending between said brackets and rigidly joined to the brackets at its respective ends, and equalizing device comprising a shaft rotatably extending through said tubular member and having means at its respective ends coacting with fixed means serving to cause equal vertical movements of said brackets, and a torsion spring located within said tubular member and acting upon said shaft to cause rotation of the shaft in a direction to aid upward movement of the elevating structure.

8. A device of the class described comprising, two spaced apart vertical tracks, two side brackets, each located adjacent a respective vertical track and having guide means traversing said tracks, a tubular member extending between said brackets and rigidly joined to the brackets at its respective ends, an equalizing device comprising a shaft rotatably extending through said tubular member and having means at its respective ends coacting with fixed means serving to cause equal vertical movements of said brackets, a torsion spring located within said tubular member and acting upon said shaft to cause rotation of the shaft in a direction to aid upward movement of the elevating structure, and manually operable means extending exteriorly of said tubular member and acting upon said spring for adjusting the tension of said spring.
9. A device of the class described comprising, two spaced apart vertical tracks, two vertical racks in fixed association with said tracks, two spaced apart brackets, each located adjacent a track and each having guide members traversing said tracks, a tubular member extending between said brackets and having its respective ends rigidly attached to the respective brackets, a shaft rotatably extending through said tubular member and having its ends adjacent the respective racks, and a pinion meshing with each rack and fixed to a respective end of the shaft.
10. A device of the class described comprising, two spaced apart vertical tracks, two vertical racks in fixed association with said tracks, two spaced apart brackets, each located adjacent a track and each having guide members traversing said tracks, a tubular member extending between said brackets and having its respective ends rigidly attached to the respective brackets, a shaft rotatably extending through said tubular member and having its ends adjacent the respective racks, a pinion meshing with each rack and fixed to a respective end of the shaft, and a torsion spring located within said tubular member and acting upon said shaft to cause rotation of the shaft in a direction to aid upward movement of the elevating structure.
11. A device of the class described comprising, two spaced apart vertical tracks, two vertical racks in fixed association with said tracks, two spaced apart brackets, each located adjacent a track and each having guide members traversing said tracks, a tubular member extending between said brackets and having its respective ends rigidly attached to the respective brackets, a shaft rotatably extending through said tubular member and having its ends adjacent the respective racks, a pinion meshing with each rack and fixed to a respective end of the shaft, a torsion spring located within said tubular member and acting upon said shaft to cause rotation of the shaft in a direction to aid upward movement of the elevating structure, and manually operable means extending exteriorly of said tubular member and acting upon said spring for adjusting the tension of said spring.
12. A device of the class described comprising, two spaced apart vertical tracks, an elevating structure mounted for vertical movement on said tracks, a carriage mounted for horizontal movement on said elevating structure, said carriage being cooperatively associated with means which acts thereon near the upper portion of the carriage's upward movement to cause the carriage to move horizontally as well as vertically.
13. A device of the class described comprising, two spaced apart vertical tracks, an elevating structure mounted for vertical movement on said tracks, a carriage mounted for horizontal movement on said elevating structure, said carriage being cooperatively associated with means which acts thereon near the upper portion of the carriage's upward movement, said means comprising a pin and a member having a slot adapted to receive said pin, said slot having a short vertical portion and an inclined portion whereby the carriage is guided vertically and then shifted horizontally.
- BAYARD E. RICHARDSON.

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