Oct. 3, 1950 G. H. JOHNSTON 2,524,386

TYPEWRITER LIFT

Filed Aug. 18, 1947 3 Sheets-Sheet 1

Fig. 1

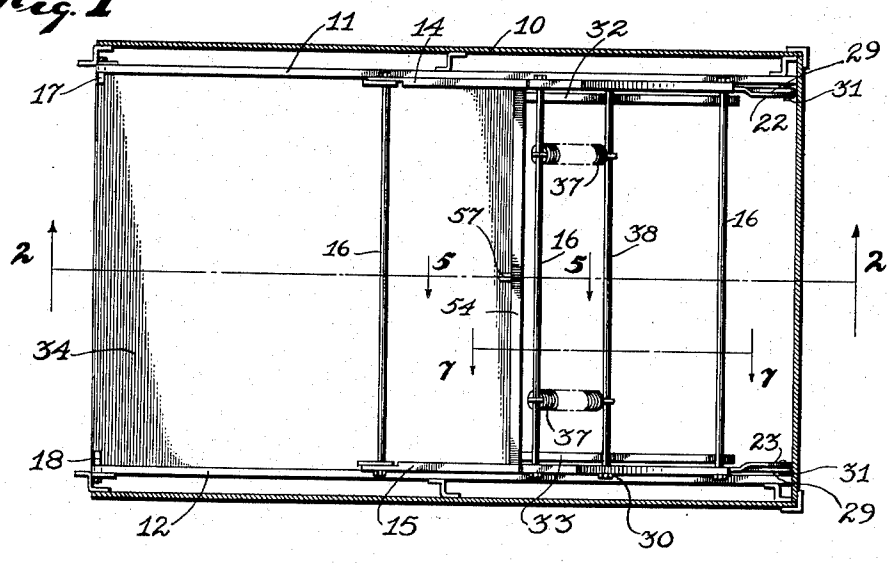
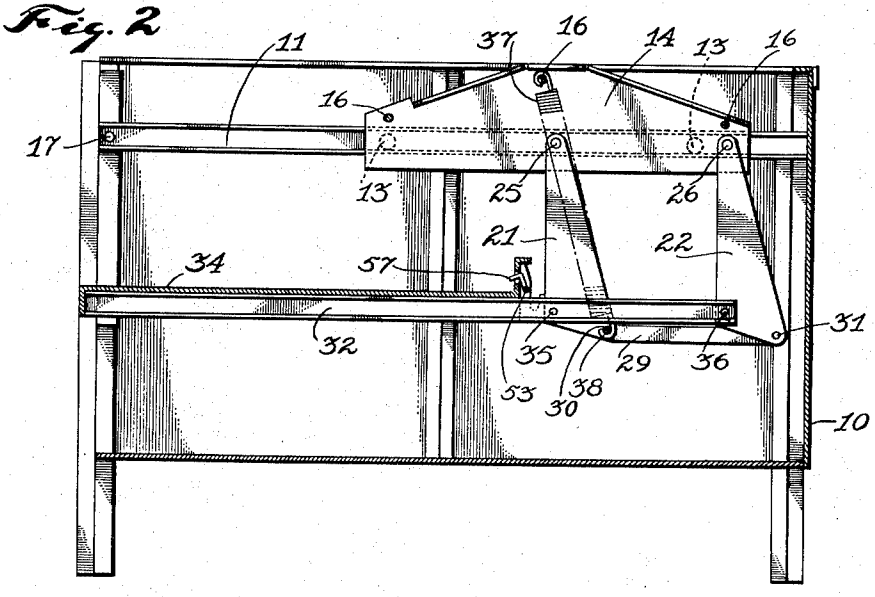


Fig. 2



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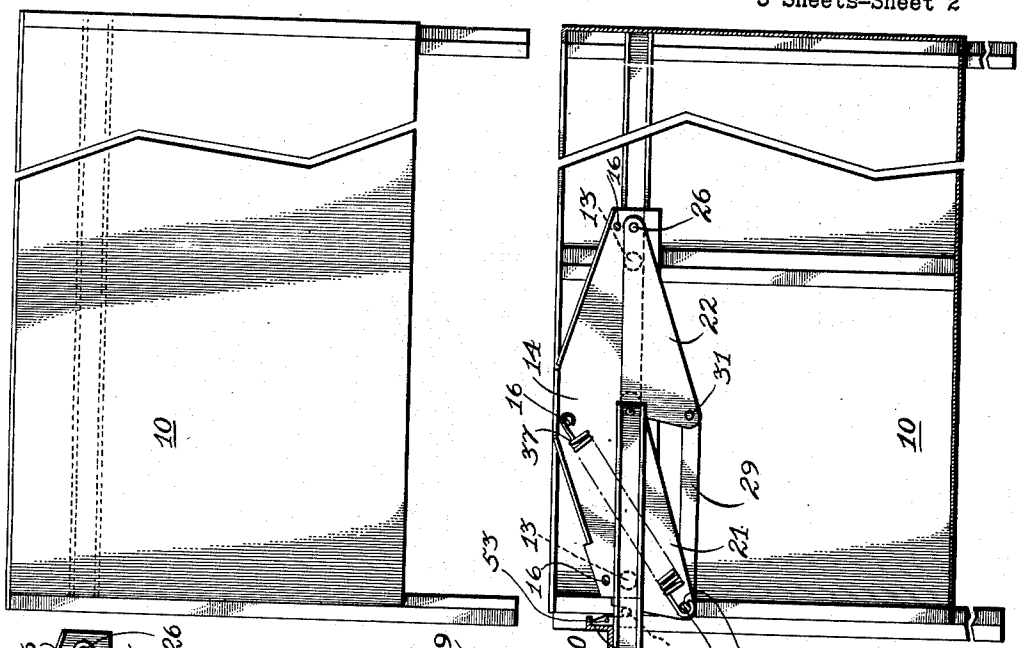


Fig. 3

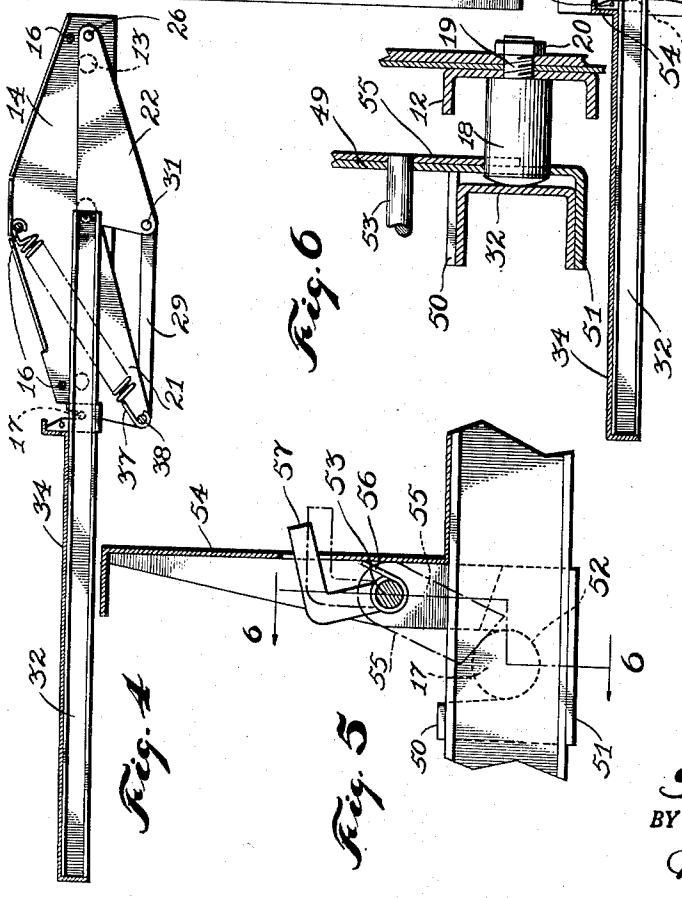


Fig. 6

Fig. 4

Fig. 5

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TYPEWRITER LIFT

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Fig. 7

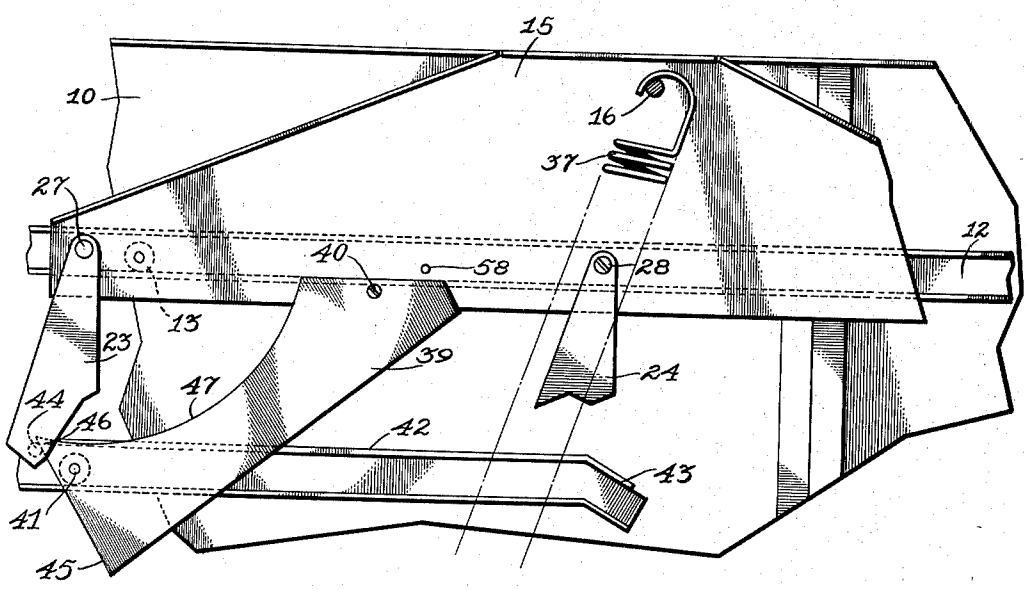
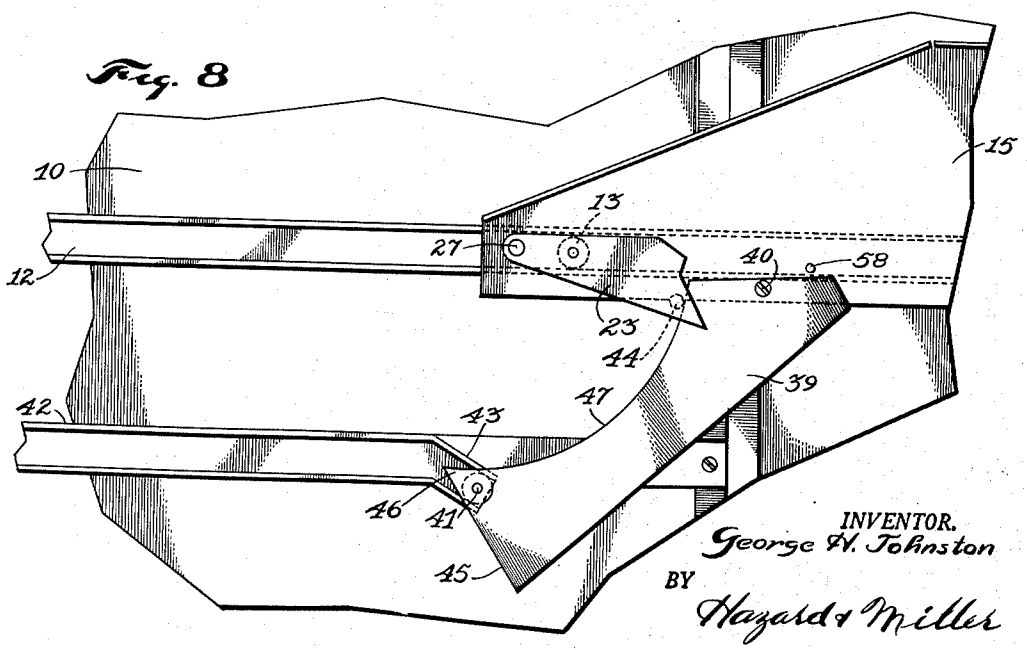


Fig. 8



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TYPEWRITER LIFT

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Application August 18, 1947, Serial No. 769,221

6 Claims. (Cl. 312—28)

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This invention relates to improvements in typewriter lifts used in typewriter desks and the like. An object of the invention is to provide an improved typewriter lift consisting mainly of a carriage mounted on rails for forward and rearward movement and which carries a typewriter table that is connected to the carriage by pairs of links that restrict movement of the table with relation to the carriage so as to maintain the table in a substantially horizontal position throughout all of its movement.

More specifically an object of the invention is to provide a typewriter lift wherein movement of the table with relation to the carriage is so restricted that the carriage can not commence its rearward movement within the cabinet within which it is disposed until the table has descended to its lowermost position when the table has been lowered or has descended to its lowermost position, the carriage is then automatically released for rearward movement on its rails to house the table and the typewriter that may be thereon within the cabinet. In a converse manner, upward movement of the table is prevented until the carriage has reached its forwardmost position and the table is then released for upward movement into its extended position. By thus restricting movements of the table with relation to the carriage damage to the typewriter is effectively prevented.

Another object of the invention is to provide a typewriter lift having the above mentioned characteristics wherein a novel and simple type of lock is utilized that is locked at the back of the typewriter table and which firmly engages cooperating parts on the cabinet so that when the typewriter table is in its upper or extended position it is locked against retracting movement and rigidly held in this position against vibration.

Still another object of the invention is to provide the typewriter lift the working parts of which can be easily and quickly bodily removed so that in the event that repairs should be required, one lift may be removed as a unit and quickly replaced by a substitute unit that may be employed while the damaged unit is being repaired.

With the foregoing and other objects in view, which will be made manifest in the following detailed description and specifically pointed out in the appended claims, reference is had to the accompanying drawings for an illustrative embodiment of the invention, wherein:

Fig. 1 is a horizontal section through a cabinet or portion of a typewriter desk illustrating the typewriter lift as installed therein and illustrating the typewriter table in its lower or retracted position;

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Fig. 2 is a vertical section taken substantially upon the line 2—2 upon Fig. 1;

Fig. 3 is a view similar to Fig. 2 but illustrating the typewriter table in extended position;

Fig. 4 is a view in side elevation of the typewriter desk and illustrating the typewriter lift as having been bodily removed therefrom for purposes of either repair or replacement;

Fig. 5 is a partial view in vertical section illustrating details of the lock, taken on the line 5—5 on Fig. 1;

Fig. 6 is a sectional view taken upon the line 6—6 upon Fig. 5;

Fig. 7 is a partial view on an enlarged scale taken substantially upon the line 7—7 upon Fig. 1 in the direction indicated to illustrate details of construction; and

Fig. 8 is a view similar to Fig. 7 by illustrating the parts in the other extreme position.

Referring to the accompanying drawings wherein similar reference characters designate similar parts throughout, the improved typewriter lift is illustrated as being disposed within a suitable cabinet generally indicated at 10. This cabinet may be a cabinet designed to hold the typewriter or may be a portion of a desk having a typewriter compartment and within which the lift may be installed. The typewriter lift comprises two opposed channels 11 and 12 which are stationarily mounted in the compartment adjacent the top thereof. These channels are preferably formed of channel iron having their flanges extending inwardly or toward the center of the compartment and function as longitudinally extending rails for rollers 13 that are rotatably mounted on the outer sides of a carriage. The carriage is made up of two opposed side plates 14 and 15 that are rigidly connected by means of transverse rods 16 and forward movement of the carriage with relation to the rails 11 and 12 is limited by studs 17 and 18 that are equipped with threaded shanks 19 that extend through the channels 11 and 12 respectively and fastened in place as by nuts (see Fig. 6). Pairs of links are pivotally connected at the upper ends of the carriage; one pair of links being indicated by the reference characters 21 and 22 and the opposite pair of links being indicated by the reference characters 23 and 24 (see Figs. 7 and 8). The links 21 and 22 are pivoted to the carriage at 25 and 26 respectively and the links 23 and 24 are pivoted at 27 and 28 respectively. The links

of each pair are in turn pivotally connected at their lower end to bars 29. The pivotal connections to the bars are indicated at 30 and 31. Channels 32 and 33 extend longitudinally of the compartment and have the typewriter table 34 rigidly mounted thereon. These channels extend somewhat rearwardly from the rear edge of the typewriter table and are pivoted as at 35 and 36 to the links 21, 22, 23 and 24 are of the same length. These links when freed for pivotal movement relatively to the carriage will restrict the movement of the channels 32 and 33 and the typewriter table 34 thereon to a horizontal position so that when the table is swung upwardly from the position shown in Fig. 2 to the position shown in Fig. 3 the table is maintained in a horizontal position with the typewriter, not shown, disposed thereon. Tension springs 37 connect one of the rods 16 with a transversely extending rod 38 that connects the bars 29. These tension springs are so arranged as to urge the table 34 upwardly but in the course of the movement from Fig. 2 to Fig. 3 the springs will be required to pass through a position over center designed by the axes of the pivots 25 and 28. Consequently, when the table 34 is in its lower and rearmost position with relation to the carriage, the springs will tend to retain the table and the associated structure in that position. However, when forward movement of the carriage with respect to the rails 11 and 12 is limited by the studs 17 and 18 the table 34 can be forcibly swung upwardly and forwardly and the springs after passing over center will assist in elevating the table 34 and the typewriter thereon.

It is desirable to prevent upward and forward swinging movement of the table 34 with relation to the carriage until the carriage is at its extreme forwardmost position on the rails 11 and 12 and then only permit the table to be elevated. Conversely, in lowering the table 34 it is desirable to prevent rearward movement of the carriage until the table 34 has reached its lowermost position and then free the carriage for rearward movement on the rails 11 and 12. To this end the side plate 15 of the carriage has a locking plate 39 pivotally mounted thereon as at 40. This locking bar carries a roller 41 that is rotatably mounted on its outer side and which is disposed in a track formed by a channel 42. This channel has its forward end bent downwardly as indicated at 43 and is so arranged that when the carriage is moving toward the forward ends of the rails 11 and 12 the locking plate 39 remains in the position shown in Fig. 7 with the roller 41 merely rolling along the horizontal portion of the track or channel 42. The link 23 carries a stud 44 that projects inwardly from the side thereof and which is engaged with the edge 45 on the locking bar. Consequently, as long as the locking bar remains in the position shown in Fig. 7, the engagement between the stud 44 and the edge 45 prevents swinging movement of the link 23 with respect to the carriage. As the link 23 can not swing with relation to the carriage the swinging movement of its companion link 24 is likewise prevented due to its connection therewith through a bar 29 and as the rod 38 connects the two bars 29 links 21 and 22 can not swing with relation to the carriage. In this manner, swinging movement of the links 21, 22, 23 and 24 is prevented until the carriage reaches its forwardmost position on the rails 11 and 12. In this position the roller 41 descends in the downwardly bent forward end 43 wherein the locking plate 39 is allowed to descend slightly so that the point 46 on the locking plate clears the stud 44. The plate 39 brings an arcuate edge 47 that is substantially concentric with the pivot 27 and when the plate 39 has descended into the position shown in Fig. 8 the stud 44 then may be swung by its link 23 in an arcuate path that is in close proximity with the edge 47. It will thus be appreciated that swinging movements of the links 21, 22, 23 and 24 with relation to the carriage is prevented during forward movement of the carriage until the roller 41 starts descending the downwardly inclined portion 43. However, when the roller starts down the inclined portion 43 this lowers the locking plate 39 sufficiently to permit the stud 44 to be swung adjacent the edge 47. Consequently, when the carriage is in its forwardmost position the table 34 is released for forward swinging movement. Conversely, if the carriage is urged rearwardly while the table 34 is in its uppermost position as shown in Fig. 3 rearward movement of the carriage is prevented until the table 34 has been lowered. In other words, as long as the table 34 is elevated or in process of being elevated or lowered and the link 23 is in the position shown in Fig. 8 rearward forces applied to the carriage are effective to cause the locking plate 39 to force the roller 41 upwardly on the inclined portion 43. However, upward swinging movement of the locking plate 39 is prevented by the stud 44 being in engagement with the edge 47. As the table 34 is swung downwardly to cause the plate 23 to return from the position shown in Fig. 8 to the position shown in Fig. 7, the stud 44 will clear the edge 47 by passing beyond the points 46 and thus permit the required upward swinging movement of the plate 39. Consequently, when the table has been lowered into its lowermost position wherein link 23 is in the position shown in Fig. 7 the locking plate 39 has its roller 41 automatically freed to return from the inclined portion 43 to the horizontal portion of the channel 42. The carriage may then be forced rearwardly on the rails 11 and 12 returning the table to a position entirely within the cabinet or compartment as shown in Fig. 2.

A means is provided for locking the table 34 in its uppermost position and to this end there are fittings 49 that are equipped with flanges 50 and 51 that are spot welded or otherwise secured to the flanges of the channels 32 and 33. These fittings provide open-topped notches or recesses 52 that are disposed outwardly of the channels 32 and 33 and which are designed to receive the ends of the studs 17 and 18 when the table is swung into its uppermost position. The fittings also serve to pivotally support a rocker shaft 53 that extends transversely and behind the upstanding flange 54 at the back of the table 34. This rocker shaft carries a latch 55 at each end thereof which can be swung into locking engagement with the upper portion of the stud as illustrated in Fig. 5. A torsion spring 56 urges the rocker shaft into this position and a small crank 57 is rigid with the rocker shaft and extends through an aperture in the flange 54. This crank serves as a handle to rock the rocker shaft 53 when positioned to shift the latches 55 out of engagement with the studs. The arrangement is such that on elevating the table 34 into the position shown in Fig. 3 the studs enter the notches 52 and depress the latches 55 across the action of the springs 56. When the table 34 is in its uppermost position these latches automatically re-

turn into locking position as shown in Fig. 5 to lock the table in its uppermost position and provide a relatively rigid structure. When it is desired to lower the table the crank **57** is merely forced rearwardly against the action of the spring **56** and causing the latches **55** to disengage the studs thus freeing the table **34** for descending movement.

A feature of the construction resides in the ability to bodily remove the lift from the cabinet as a unit. This is accomplished by merely undoing the nuts **20** and removing the studs **17** and **18**. When the studs are removed there is nothing to limit forward movement of the carriage with relation to the rails **11** and **12** and, consequently, the carriage and all associated structure may be pulled out of the cabinet as illustrated in Fig. 4 and bodily replaced. During such forward movement the roller **41** merely rolls down out of the forward end **43** of the channel **42**. The plate **39**, however, is maintained in a position wherein on reinsertion of the lift into the cabinet the roller **41** will be disposed at approximately the position of the open end of the downwardly bent portion **43**. To this end a stop pin **58** is mounted on the carriage and is engageable with an edge of the plate **39** to limit counter clockwise rotation of the plate **39** about its pivot **40** under the influence of gravity when the lift is removed. It is usually advisable, however, to swing the table **34** into its uppermost position with relation to the carriage as shown in Fig. 4 before withdrawing the lift from the cabinet.

From the above described construction it would be appreciated that an improved typewriter lift is provided which is of relatively simple construction and which can be easily and durably manufactured. The device is quite positive in its operation in that the table can not be lifted until the carriage is in its forwardmost position. Then the table is released for upward swinging movement. Conversely, it is impossible to force the carriage rearwardly until the table is in its lowermost position. In this manner the springs **37** are prevented from effecting or influencing movements of the table or carriage except in proper sequence of operation. Danger of damaging the typewriter or similar article on the table is consequently eliminated.

Various changes may be made in the details of construction without departing from the spirit and scope of the invention as defined by the appended claims.

I claim:

1. A typewriter lift comprising a pair of opposed side rails, a carriage movable thereon, a table disposed in the space between the side rails, pairs of links pivotally connected to the carriage and to the table arranged to cause the table to remain in substantially horizontal position during its movement relative to the carriage whereby the table may assume an upper position forwardly of the rails or a lower retracted position beneath the rails, a locking member pivotally mounted on the carriage, a channel in which the locking member has a portion movably mounted, the major portion of the channel being horizontal with the forward end thereof extending downwardly and a stud on one of the links engageable with the locking member while said portion is in the horizontal portion of the channel to prevent swinging movement of the link, the locking member presenting an edge concentric with relation to the center of rotation of said one of the links against which the stud is adapted to bear when said portion on the locking member is disposed in the downwardly bent portion of the channel whereby upward and forward swinging movement of the table with relation to the carriage is prevented until the carriage has reached the forward end of its movement on its rails and, conversely, rearward movement of the carriage on its rails is prevented until the table has been lowered into its lower retracted position.

2. A typewriter lift comprising a pair of opposed side rails, a carriage movable thereon, a table disposed in the space between the side rails, links pivotally connected to the carriage and to the table arranged to cause the table to remain in substantially horizontal position during its movement relative to the carriage whereby the table may assume an upper position forwardly of the rails or a lower retracted position beneath the rails, studs removably mounted at the forward ends of the rails for limiting forward movement of the carriage thereon, means on the table engageable with the studs for releasably locking the table in its upper position, the forward ends of the rails being open whereby on removal of the studs the carriage, links and table may be bodily removed therefrom.

3. A typewriter lift comprising a pair of opposed side rails, a carriage movable thereon, a table disposed in the space between the side rails, links pivotally connected to the carriage and to the table arranged to cause the table to remain in substantially horizontal position during its movement relative to the carriage whereby the table may assume an upper position forwardly of the rails or a lower retracted position beneath the rails, studs removably mounted at the forward ends of the rails for limiting forward movement of the carriage thereon, means on the table engageable with the studs for releasably locking the table in its upper position, the forward ends of the rails being open whereby on removal of the studs the carriage, links and table may be bodily removed therefrom and means for restricting up and down movements of the table with relation to the carriage to a position wherein the carriage is in its forwardmost position on the rails.

4. A typewriter lift comprising a pair of opposed side rails, a carriage movable thereon to a forward position, a table disposed in the space between the side rails, means including links connecting the carriage and the table arranged to cause the table to remain in substantially horizontal position during its movement relative to the carriage whereby the table may assume an upper position forwardly of the rails or lower retracted position, a locking member swingably mounted on the carriage, means providing a guide, a major portion of which guide is straight with a forward minor portion at an angle to the major portion, the locking member having a portion movable in the guide, and a locking piece on one of the links engageable with the locking member while said portion of the locking member is in the major portion of the guide to prevent swinging movement of the links, the locking member presenting an arcuate edge about the center of rotation of said one of the links against which the locking piece is adapted to bear when said portion on the locking member is disposed in the minor portion of the guide whereby upward and forward swinging movement of the table with respect to the carriage is prevented until the carriage has reached the forward end of its movement on its rails and conversely, rearward movement of the

carriage on its rails is prevented until the table has been lowered into its lower retracted position.

5. A typewriter lift comprising a pair of opposed side rails, a carriage movable thereon to a forward position, a table disposed in the space between the side rails, means including links connecting the carriage and the table arranged to cause the table to remain in substantially horizontal position during its movement relative to the carriage whereby the table may assume an upper position forwardly of the rails or lower retracted position, a locking member swingably mounted on the carriage, means providing a guide, a major portion of which guide is straight with a forward minor portion at an angle to the major portion, the locking member having a portion movable in the guide, a locking piece on one of the links engageable with the locking member while said portion of the locking member is in the major portion of the guide to prevent swinging movement of the links, the locking member presenting an arcuate edge about the center of rotation of said one of the links against which the locking piece is adapted to bear when said portion on the locking member is disposed in the minor portion of the guide whereby upward and forward swinging movement of the table with respect to the carriage is prevented until the carriage has reached the forward end of its movement on its rails and conversely, rearward movement of the carriage on its rails is prevented until the table has been lowered into its lower retracted position, and means for locking the table when it is swung to its upper position.

6. A typewriter lift comprising a pair of opposed side rails, a carriage movable thereon, a table disposed in the space between the side rails, links pivotally connected to the carriage and to the table arranged to cause the table to remain in substantially horizontal position during its movement relative to the carriage whereby the table may assume an upper position forwardly of the rails or a lower retracted position beneath the rails, stops at the forward ends of the rails for limiting forward movement of the carriage thereon, means on the table engageable with the stops when the table is moved to its upper position, and means providing a spring actuated latch for locking the first named means and the stops together upon engagement of said first named means and the stops.

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