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CARRIAGE LOCKING MEANS FOR BUSINESS MACHINES

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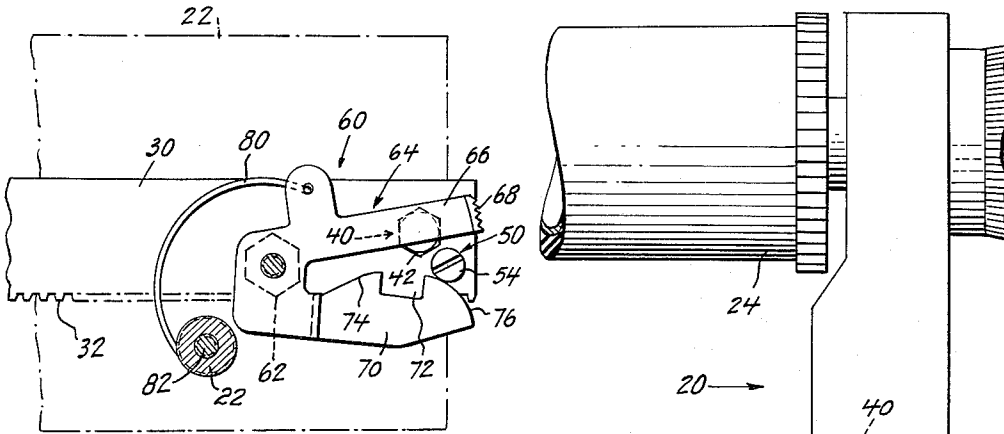


FIG. 4.

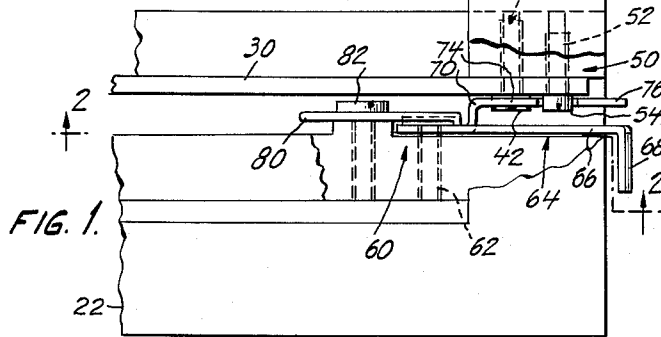


FIG. 1.

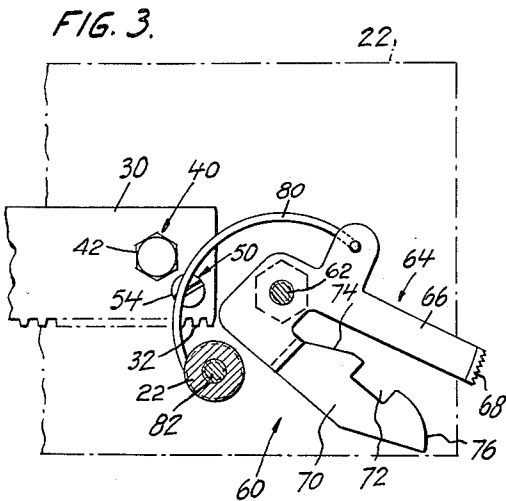


FIG. 3.

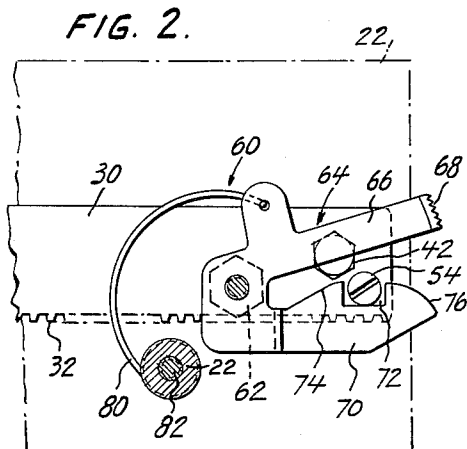


FIG. 2.

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CARRIAGE LOCKING MEANS FOR BUSINESS MACHINES

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1 Claim. (Cl. 197—193)

This invention relates to the carriages which are carried by business machines and like equipment, for movement with respect to a main portion of the machine, and more particularly to mechanism for locating such a carriage in a predetermined position with respect to such main portion of the machine and for locking such a carriage against movement from said predetermined position.

Many business machines (such as typewriters, calculators, etc.), and like equipment, are provided with carriages which carry some of the mechanism of the machine; which are carried by a main portion of the machine for movement with respect thereto, usually side to side; and which cooperate with mechanism mounted the main portion of the machine, during such movement, to perform various operations of the machine. In some instances the carriage is narrower than the main portion of the machine; in other instances it is wider than the main portion of the machine. In each instance it may become necessary to locate such carriage in a predetermined position with respect to such main portion of the machine and at times to lock such carriage in said predetermined position. It is especially important that the carriage be located and locked in such a predetermined position, usually a position which is centered or otherwise symmetrically disposed with respect to the main portion of the machine, during shipment of the machine and during storage of the machine following the day to day normal use thereof. The disposition of an office type machine in its shipping container and of a portable type machine in its carrying case is easier and most of the time less expensive when the carriage is so centered with respect to the main portion of the machine. Furthermore since the carriage is normally permitted relative movement with respect to the main portion of the machine it is essential that it be locked against such movement during shipment or transportation of the machine because any inadvertent movement thereof could result in damage to the elements or mechanisms therein.

Some equipment manufacturers utilize bolts, screws, or other types of semi-permanent releasable securing means to secure the carriage in position with respect to the main portion of the machine during shipment thereof. However such forms of securing means require tools for removal thereof and are not readily reusable as would be essential for an office type machine during movement thereof into and out of a conventional secretary's desk, and for a portable type machine to facilitate disposition thereof in the carrying case therefore. Other manufacturers have contrived various forms of locating and locking structures which are reusable, but these are usually complex and expensive, often requiring some modification of the structure of both the carriage and the main portion of the machine, and at times requiring extensive modification of such structures. Furthermore most of said reusable locating and locking structures are impossible in their operation in that both the portion thereof carried by the carriage and the portion thereof carried by the main portion of the machine are resiliently mounted and either one or both of said portions may yield in response to the application of an abnormal force thereon.

It is therefore an object of this invention to provide an improved mechanism for locating the movable carriage of a business machine, or like equipment, in a predeter-

mined position with respect to a main portion of the machine.

Another object is to provide an improved mechanism for locking the movable carriage of a business machine, or like equipment, against movement from a predetermined position with respect to a main portion of the machine.

Yet another object is to provide an improved, inexpensive and simple to operate, mechanism for locating and locking the movable carriage of a business machine, or like equipment, in a predetermined position with respect to a main portion of the machine.

A further object is to provide an improved mechanism for positively locating and locking the movable carriage of a business machine, or like equipment, in a predetermined position with respect to a main portion of the machine.

This invention involves a business machine, or like equipment, having some of the component elements and mechanisms thereof disposed in a normally stationary main portion of the machine and other component elements and mechanisms thereof disposed in a carriage carried by such main portion for transverse movement with respect thereto; and contemplates providing a selectively actuatable and positively acting mechanism for locating such carriage in a predetermined position with respect to the main portion of the machine, and for locking such carriage against movement from such predetermined position.

In carrying out the invention, according to a preferred embodiment, a permanent stop is disposed in a predetermined position on the movable carriage of the machine. A selectively actuatable locating and locking device comprising a substantially U-shaped lever is disposed on the main portion of the machine for movement between an operative position, coacting with said permanent stop to positively locate and lock the carriage in a predetermined position with respect to the main portion of the machine; and an inoperative position permitting unrestricted movement of such carriage with respect to the main portion of the machine. An overcenter spring having a bow shape acts on such locating and locking device to facilitate movement thereof into said operative and inoperative positions and to facilitate retention and action thereof in said operative position and also retention in inoperative position.

Other objects, features, and advantages of the invention in its details of construction and arrangement of parts, will be seen from the above, from the following description of the preferred embodiment when considered in conjunction with the drawing, and from the appended claim.

In the drawing:

FIG. 1 is a plan view of fragmentary parts of the main portion and carriage of a business machine cut away in part to show the details of a locating and locking mechanism therefore, embodying the present invention;

FIG. 2 is a fragmentary sectional view taken on line 2—2 of FIG. 1 showing the locating and locking mechanism thereof in its spring determined actuated and locked condition as seen from the rear of the machine and with the main portion of the machine shown in phantom;

FIG. 3 is a view similar to that of FIG. 2 but showing the locating and locking mechanism thereof in its spring determined unactuated condition; and

FIG. 4 is a view similar to that of FIG. 2 but showing the locating and locking mechanism thereof in its actuated but, as yet, unlocked condition.

For convenience the invention will be described as applied to the movable carriage and main portion of a typewriter, it being understood nevertheless that without departing from the scope of this invention that subject lo-

cating and locking mechanism may be applied to the movable carriage and main portion of other business machines, such as calculators, etc., and to the movable carriage and main portion of any other equipment wherein the movable carriage is to be located and locked in a predetermined position with respect to the main portion of the machine.

With reference to FIG. 1 the number 20 generally designates a carriage mounted for transverse, side to side, movement on a main portion 22 of the typewriter and carrying a conventional cylindrical platen 24 for movement therewith. A rack 30 disposed on carriage 20 as part of it, is provided with a plurality of teeth 32 (FIGS. 2, 3 and 4) disposed thereon for coaction with conventional escapement structure (not shown) and coacting therewith to control the side to side movement of carriage 20 with respect to main portion 22 of the typewriter.

A threaded member 40, formed with a hexagonal head 42, interconnects the right end of rack 30 to carriage 20 while a similar threaded member connects the left end of rack 30 to carriage 20 such that rack 30 and carriage 20 are secured together for conjoint movement one with the other. A stop 50 (FIG. 1) having formed therewith a threaded portion 52 (FIG. 1) and a round head 54 is disposed on carriage 20 with head 54 thereof located at a lower level than heads 42 of threaded members 40 (FIG. 2). Stop 50 constitutes the only added member fixed to be located in a predetermined position on carriage 20; in this instance a position which permits a coaction of stop 50 of locating and locking device 60 with its lever 64, carried by main portion 22 of the typewriter, so as to arrest movement of carriage 20 in a centered position with respect to main portion 22 of the typewriter and with the respective sides of carriage 20 and main portion 22 in alignment one with the other (FIG. 1).

A stud 62 pivotally mounts the lever as a locating and locking member 64, of U-shape, to main portion 22 of the typewriter. An upper or operating arm 66 is formed on locating and locking member 64 with a finger tab 68 disposed thereon and extends from the pivot stud 62 outwardly to the side of main portion 22 of the typewriter. A lower or locating and locking arm 70 is formed on locating and locking member 64 and also extends toward the same side in a plane removed from the plane of action of operating arm 66 (FIG. 1) and adapting same for coaction with stop 50. A recess 72, adapted to receive round head 54 of stop 50 to a depth greater and less than its radius and diameter, respectively, and a pair of cam surfaces 74 and 76, disposed for coaction with round head 54 of stop 50, are formed on locating and locking member 64.

A bow-shaped spring 80 disposed between the above noted planes of the arms (FIG. 1) has one end thereof secured to a stud 82 mounted on main portion 22 of the typewriter and the other end thereof secured to actuating arm 66 of locating and locking member 64. Spring 80 acting in overcenter fashion with respect to the line of the centers of pivots 62 and 82 urges locating and locking members 64 into either an actuated position wherein said other end of spring 80 is located on one side of the line to the left of a first pivot 62 and a second pivot at stud 82 (FIGS. 1, 2 and 4) or an unactuated position wherein this other end of spring 80 is located over the line to the right of pivot 62. As such, spring 80 determines these two positions and resists movement of locating and locking member 64 from whatever position it is located in but once movement thereof is initiated by the operator and the line joining the ends of spring 80 passes over the center of pivot 62, while circumventing it, then spring 80 assists the operator and urges locating and locking member 64 into its new position and retains it there without extraneous stops or detents.

In normal operation of the typewriter unrestricted movement of carriage 20 with respect to main portion 22

of the typewriter is permitted by moving locating and locking device 60 to its unactuated position (FIG. 3) thus removing locating and locking arm 70 thereof from the path of movement of stop 50. At such time as it is desired to ship the typewriter, or to place same within a desk or carrying case, the operator need only grasp finger tab 68 and rotate locating and locking device 60 in the counterclockwise direction about pivot 62 (FIG. 3). Spring 80 first resists movement of locating and locking member 64, of locating and locking device 60, out of its unactuated position (FIG. 3) but as spring 80 passes over the center of rotation of pivot 62 it assists in the movement of locating and locking member 64 into its actuated position (FIGS. 1, 2 and 4). In the actuated position of locating and locking member 64 cam surfaces 74 and 76 and recess 72 of arm 70 thereof are disposed in the path of movement of round head 54 of stop 50 (FIG. 4). As carriage 20 moves with respect to main portion 22 of the typewriter round head 54 of stop 50 first contacts either cam surface 74 or cam surface 76 (FIG. 4), depending upon the direction of movement of carriage 20, and then coacts therewith to pivot locating and locking member 64 in the clockwise direction (FIG. 4) against the bias of spring 80. As head 54 passes off of the cooperating cam surface 74, 76, spring 80 moves locating and locking member 64 in the counterclockwise direction about pivot 62 (FIG. 4) seating head 54 of stop 50 because of its roundness gradually in recess 72 of locating and locking arm 70 of locating and locking member 64 (FIG. 2). Because the sides of recess 72 are straight in blocking relationship across the path of carriage stop 50, head 54 is positively restrained therein terminating (except for usual clearance between head 54 and arm 70) all movement of carriage 20 with respect to main portion 22 of the typewriter and preventing any further movement thereof. To release carriage 20 for side to side transverse movement with respect to main portion 22 of the typewriter the operator need only pivot locating and locking member 64 in the clockwise direction about pivot 62 (FIG. 2) moving same from its actuated and locked position (FIG. 2) to its unactuated position (FIG. 3) and again moving locating and locking arm 70 thereof out of the path of movement of head 54 of stop 50 threaded into the carriage.

It should be noted that stop 50 is fixed and will not yield in response to the application of an abnormal force thereto. It should be further noted that the installation of both stop 50 and locating and locking device 60 requires only a slight modification of the typewriter and in no way interferes with the normal operation of the other instrumentalities thereof.

In the illustrated embodiment stop 50 and locating and locking lever 64 of device 60 have been disposed to one side of the typewriter, however, they need not be so located but may instead be located in any position along the back of carriage 20 and on main portion 22 respectively of the typewriter which is convenient to the operation and use thereof. In addition although stop 50 and locating arm 70 have been disposed at a level lower than the level of threaded members 40 they need not be so located but may instead be located at the same level therewith and with stop 50 acting in place of threaded member 40 which is disposed at the right end of rack 30. In such an installation either the head of the threaded member, similar to threaded member 40, which is disposed at the left end of rack 30 would have to be made flush with the surface of rack 30, or head 54 of stop 50 would have to be extended so as to cooperate with arm 70 of locating and locking device 60 in a plane removed from the plane of head 42 of threaded member 40.

From the above description it will thus be seen that a novel and improved mechanism has been provided for locating and locking a movable carriage in a predetermined position with respect to a main portion of a business machine, or like equipment, which mechanism is of

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inexpensive and simple construction, requires a minimal amount of modification of the typewriter, and is positive in operation and action.

It is understood that although we have shown the preferred form of our invention, that various modifications may be made in the details thereof without departing from its spirit as comprehended by the following claim.

We claim:

A locating and locking device for a typewriter or like machine which includes a carriage movable in a path adjacent a fixed body portion of the machine, comprising:

(a) U-shaped lever consisting of an integral pair of arms pivotly mounted on the fixed body portion of the machine and movable about a pivot between a locking position and an unlocking position,

(b) one of said arms extending outwardly in one direction from the machine for manual manipulation by an operator and the other of said arms extending outwardly in the same general direction and being provided with a recessed portion,

(c) a stop member secured to said movable carriage and projecting into said path of carriage movement sufficiently to engage said lever, said stop member being dimensioned to be accommodated within said recessed portions so as to lock said movable carriage to said fixed body portion of the machine, and

(d) a spring member having one end secured to said fixed body portion of the machine and the other end secured to said lever for movement,

(e) said spring member being bowed so that said

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spring member partially surrounds said pivot but does not move over said pivot during movement of said lever between its said positions, said bowed spring member being positioned so that a straight line joining said spring member ends moves over said pivot during movement of said lever from one of its said positions to the other of its said positions to thereby provide an over-centering action of said lever,

(f) said one lever arm being offset in a different plane with respect to said other arm to permit unobstructed movement of said one arm past said stop member.

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