United States Patent

Moehlenpah et al.

[15] **3,687,239**

[45] **Aug. 29, 1972**

[54] **CARRIAGE WITH TRACK CLAMP**

[72] Inventors: **Walter G. Moehlenpah,** Ladue; **Dennis G. Farnsworth,** Manchester, both of Mo.

[73] Assignee: **Hydro-Air Engineering, Inc.,** St. Louis, Mo.

[22] Filed: **Oct. 16, 1970**

[21] Appl. No.: **81,484**

[52] **U.S. Cl.**.....**188/43,** 188/38

[51] **Int. Cl.**.....**B61h 7/12**

[58] **Field of Search**.....105/369 A, 369 C, 369 R; 188/33, 38, 39, 42, 43

[56] **References Cited**

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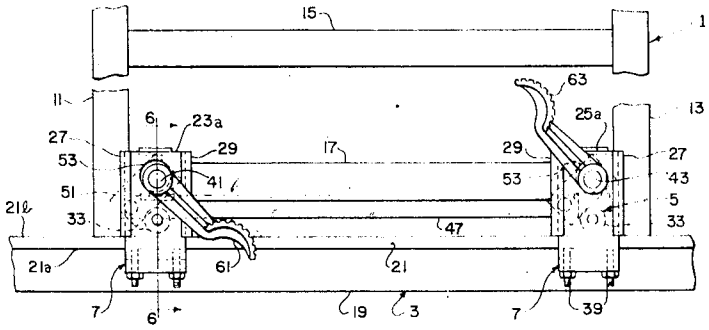
Primary Examiner—Duane A. Reger

Attorney—Koenig, Senniger, Powers and Leavitt

[57] **ABSTRACT**

A carriage with rollers for rolling it to different positions of adjustment along a track, and with means carried by the carriage for securely clamping it in adjusted position on the track. In clamping the carriage on the track, the carriage is brought to bear on the track and the rollers are raised clear of the track, and in unclamping the carriage, the rollers are lowered to engage the track and the carriage is raised clear of the track.

14 Claims, 12 Drawing Figures



PATENTED AUG 29 1972

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SHEET 1 OF 3

FIG. 1

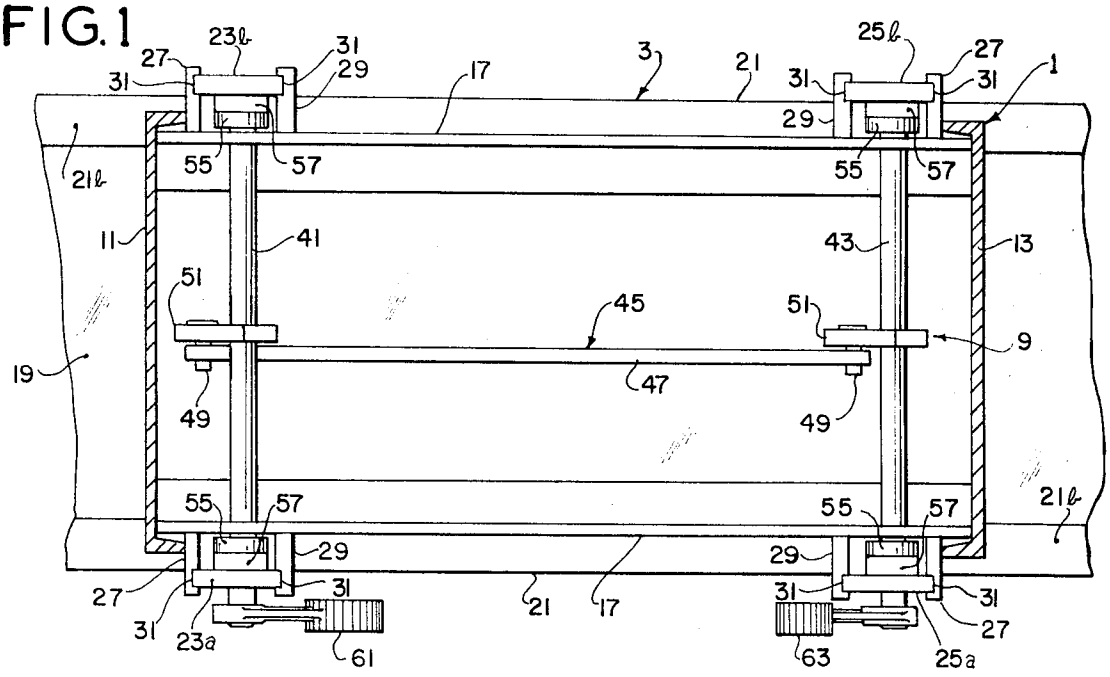


FIG2

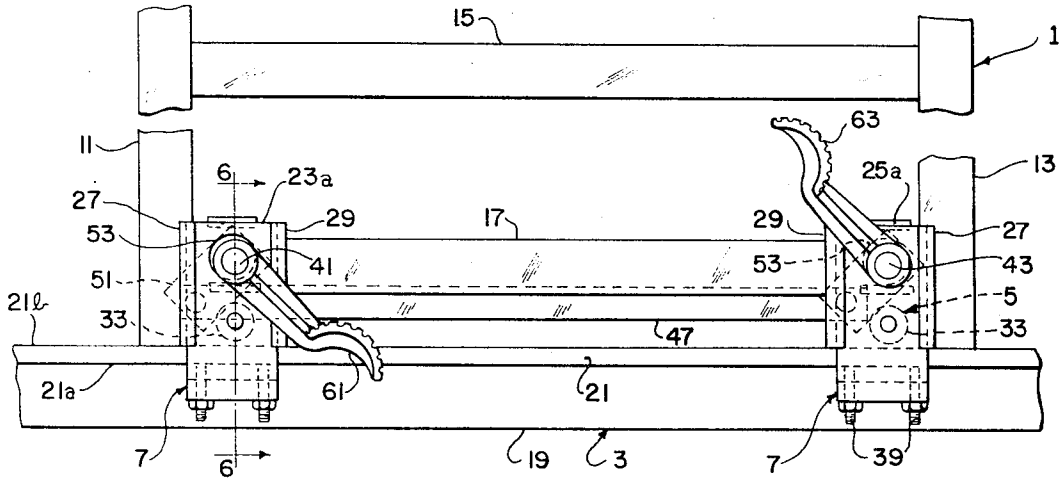
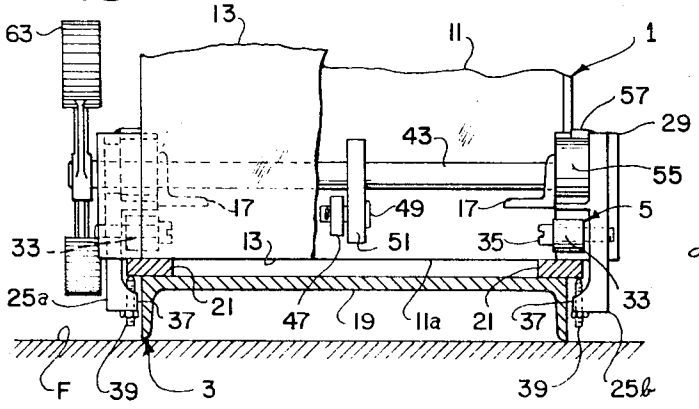


FIG. 3



Walter G. Moehlenpah,
Dennis G. Farnsworth,
Inventors.
Koenig, Senniger,
Powers and Leavitt,
Attorneys.

FIG.4

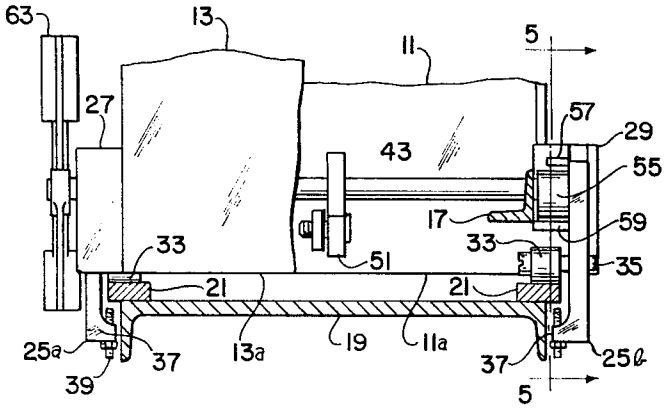


FIG.5

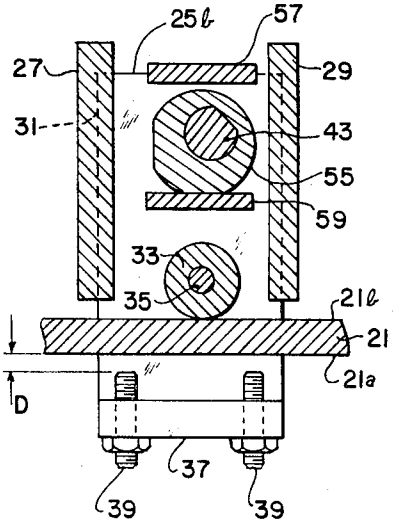


FIG.6

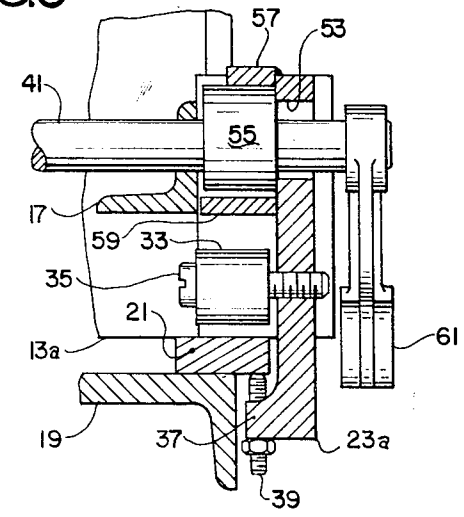


FIG.7

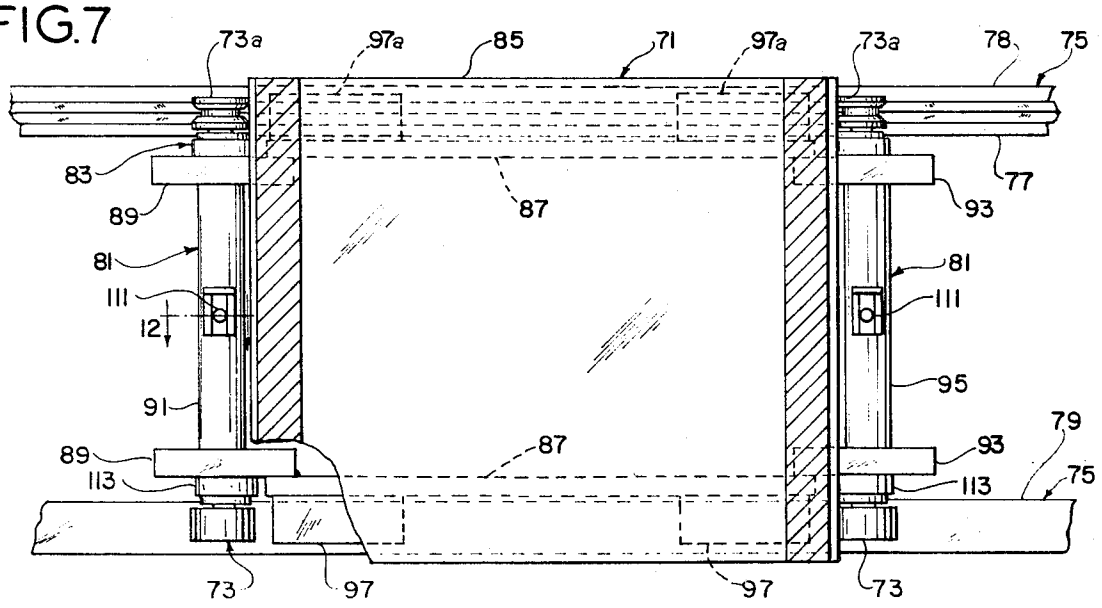


FIG.8

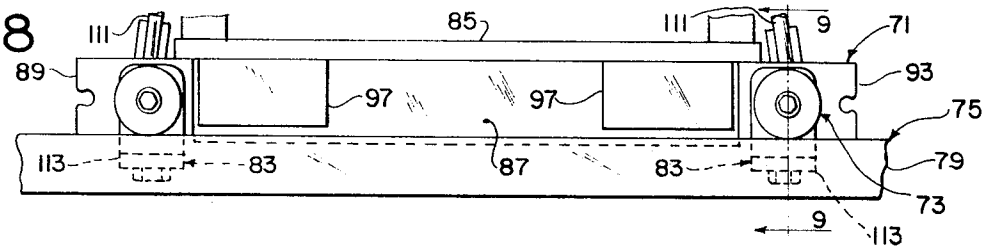


FIG.9

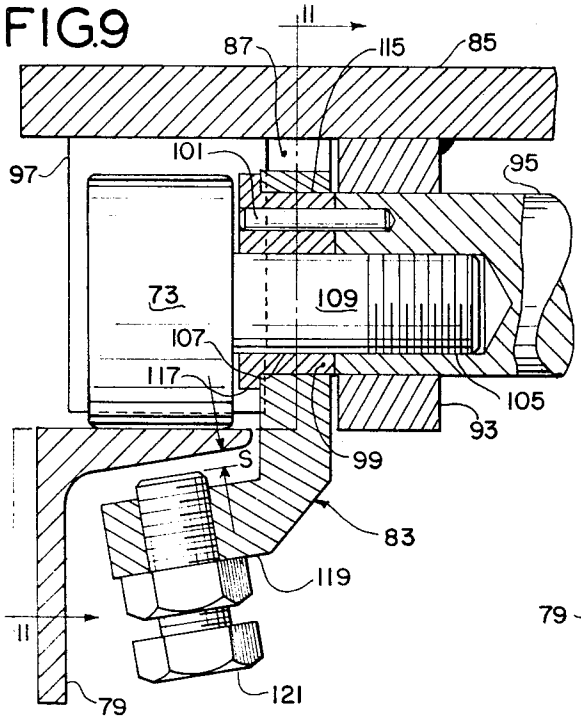


FIG.10

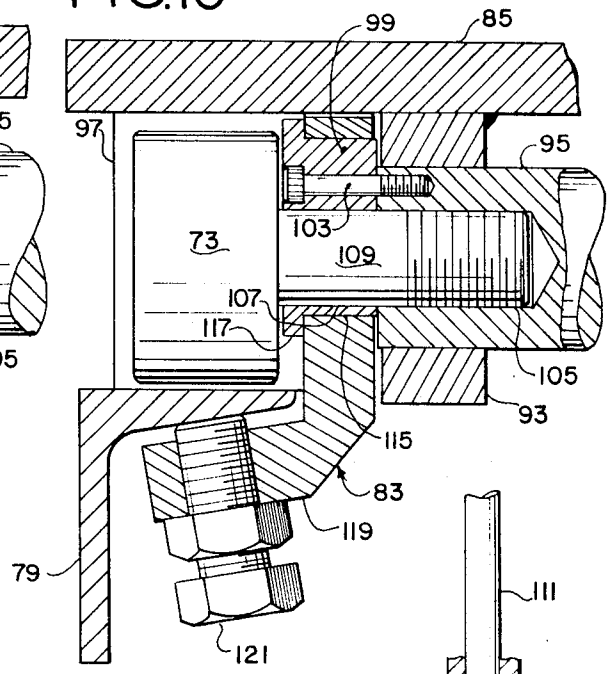


FIG.11

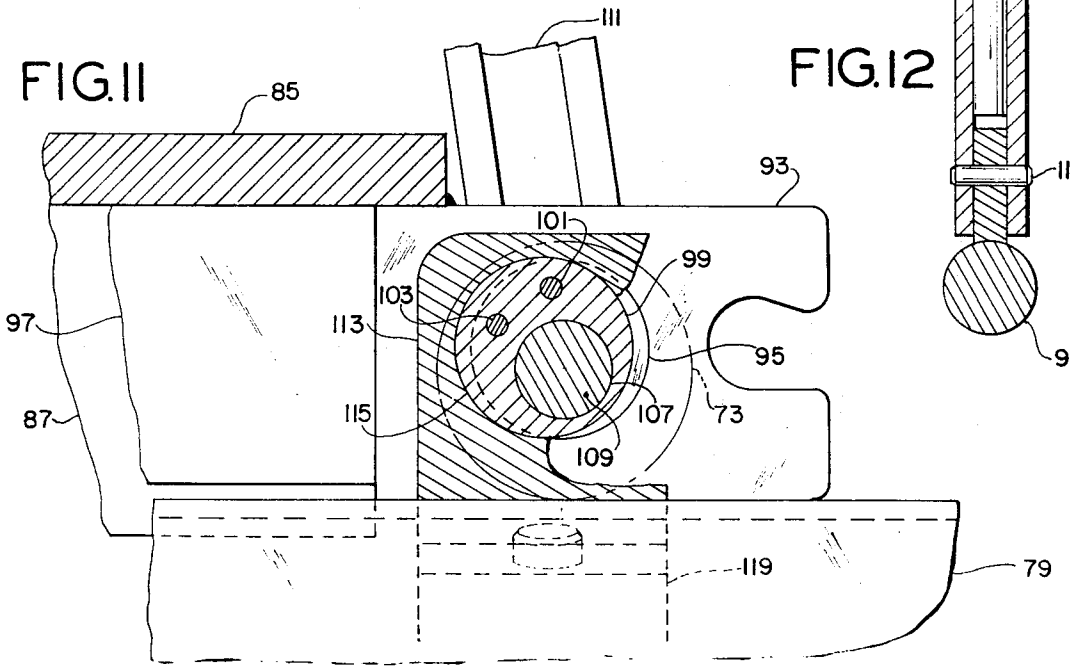
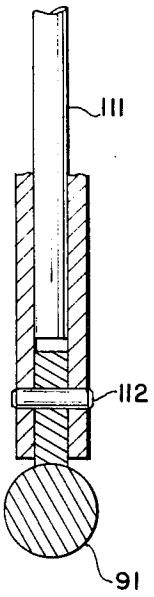


FIG.12



CARRIAGE WITH TRACK CLAMP

BACKGROUND OF THE INVENTION

This invention relates to carriage track clamps, and more particularly to a carriage, such as a machine carriage, which is movable along a track and which carries means for securely clamping it to the track at any position of adjustment therealong.

U.S. Pat. Nos. 3,068,484, 3,069,684 and 3,389,528 show machines for joining together wood members to form trusses, using nailing plates, and having pedestals with locator plate assemblies for holding the nailing plates in position to be pressed into the truss members. The pedestals are slidable on tracks to different positions of adjustment thereon and are clamped to the track in adjusted position. Reference is also made to U.S. Pat. No. 3,068,483 and application Ser. No. 696,323 filed Jan. 8, 1969 which show hydraulic presses each having a base slidable on a track to different positions of adjustment thereon and clamped to the track in adjusted position. This invention is especially concerned with the provision of such pedestals, presses or other items in the nature of a carriage adjustable along a track to various positions of adjustment thereon and adapted to be clamped to the track in adjusted position therealong. The manual sliding of these prior pedestals and presses along their tracks has been somewhat difficult in some instances, particularly in the case of the heavier presses, and this invention is directed toward solving this problem.

SUMMARY OF THE INVENTION

Among the several objects of this invention may be noted the provision of a carriage (e.g., a pedestal or press such as above described) which is easily rolled on a track to different positions of adjustment thereon (as distinguished from sliding thereon) and which may then be securely clamped in place in an adjusted position on the track without effecting any further movement of the carriage along the track; the provision of such a carriage with roller means wherein the roller means is not subject to stress when the carriage is clamped to the track; and the provision of such a carriage wherein the clamping means is quickly and readily operable for clamping and release of the carriage.

In general, a carriage of this invention has roller means adapted to roll on a track for rolling the carriage to different positions along the track, means for clamping the carriage to the track, and actuating means operable for moving the clamping means between an unclamped position in which the clamp means is clear of the track and the roller means is in engagement with the track for rolling of the carriage along the track and a clamped position in which the clamp means is in engagement with the track and the roller means is substantially free of the clamping stress. The actuating means is reversely operable for moving the clamp means from its clamped position to its unclamped position. Other objects and features will be in part apparent and in part pointed out hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan of a carriage of this invention with parts shown in section;

FIG. 2 is a side elevation of the carriage;

FIG. 3 is an end elevation with parts broken away showing the carriage in its clamping position;

FIG. 4 is a view like FIG. 3 showing the carriage in its free position;

FIG. 5 is an enlarged vertical section on line 5—5 of FIG. 4;

FIG. 6 is an enlarged vertical section on line 6—6 of FIG. 2;

FIG. 7 is a plan of a modification of a carriage of this invention;

FIG. 8 is a side elevation of the modification showing the carriage in its free position;

FIG. 9 is an enlarged vertical section on line 9—9 of FIG. 8 showing the carriage in its free position;

FIG. 10 is a view like FIG. 9 showing the carriage in its clamping position;

FIG. 11 is a vertical section on line 11—11 of FIG. 9 with some parts broken away; and

FIG. 12 is an enlarged vertical section on line 12—12 of FIG. 7.

Corresponding reference characters indicate corresponding parts throughout the several views of the drawings.

DESCRIPTION OF PREFERRED EMBODIMENTS

Referring first to FIGS. 1–6 of the drawings, there is indicated at 1 a carriage such as a pedestal of the type indicated (at 9) in U.S. patent 3,068,484, movable along a track generally designated 3 (again referring to FIGS. 1–6) to different positions of adjustment therealong, and adapted to be clamped in any adjusted position on the track. The carriage has roller means generally indicated at 5 for rolling it along the track, clamp means indicated at 7 for clamping the carriage to the track, and actuating means as indicated at 9 operable for moving the clamp means between an unclamped position in which the clamp means is clear of the track and a clamped position in which the clamp means is in engagement with the track and the roller means is substantially free of clamping stress. The actuating means is reversely operable for moving the clamp means from its clamped position to its unclamped position. The carriage and the roller means are relatively movable as will appear for movement of the carriage between a free position clear of the track (as shown in FIG. 4) with the roller means in engagement with the track and supporting the carriage for rolling along the track, and a clamping position in engagement with the track (shown in FIG. 3) with the roller means clear of the track. Actuating means 9 is further operable starting with the carriage in its free position and the roller means in engagement with the track for effecting movement of the carriage to its clamping position and then moving the roller means clear of the track. Means 9 is reversely operable starting with the carriage in its clamping position and the roller means clear of the track for effecting movement of the roller means into engagement with the track and then moving the carriage to its free position. Clamp means 7 is operable by the actuating means 9 for effecting movement of the clamp means to its clamped position when the carriage is moved to its clamping position and for effecting movement of the clamp means from the track when the carriage is moved to its free position.

More particularly, the carriage 1 is shown as comprising a pair of vertical channel members 11 and 13 constituting carriage end members, arranged with the open sides of the channels facing one another. Extending between these end members are a pair of upper side bars 15 and a pair of lower side bars 17. The channels 11 and 13 correspond, for example, to parts 41 and 43 shown in U.S. Pat. No. 3,068,484 and the upper side bars 15 correspond to the parts 99 and 101 shown in this patent. Bars 17 are of angle section, arranged with one leg vertical and one horizontal and toward the inside. The track 3 comprises a channel member 19 mounted on the floor F open side down and carrying rails 21 at opposite sides thereof. These rails are secured on the web of the channel 19 at opposite sides thereof cantilevered laterally outwardly beyond the sides of the channel so as to present lower downwardly facing clamping surfaces 21*a* outside the channel as well as their upper roller-engaging faces 21*b*.

The carriage 1 carries a first pair of roller carrier and clamp members 23*a* and 23*b* at its bottom adjacent one end thereof and a second pair of roller carrier and clamp members 25*a* and 25*b* at its bottom adjacent its other end. These members 23*a*, *b* and 25*a*, *b* are all identical, each comprising a rectangular slide vertically slidable in a pair of guides 27 and 29 alongside the carriage adjacent the respective end member 11 or 13. The guides 27 and 29 are secured as by welding to the outside of the vertical legs of the side angle member 17. They extend laterally outward from the carriage and have vertical grooves such as indicated at 31 receiving the vertical side edges of the slides 23*a*, *b* and 25*a*, *b*. Each of these slides carries on the inside thereof a roller 33 adapted to engage and roll on the top 21*b* of a respective rail 21, the roller being journalled on a screw 35 threaded in a tapped hole in the slide. The slides 23*a*, *b* and 25*a*, *b* carrying the rollers 33 being vertically movable in the guides 27 and 29, the carriage 1 and the rollers 33 are movable vertically relative to one another (i.e., the carriage may move up and down relative to the rollers and, conversely, the rollers may move up and down relative to the carriage). The rollers 33 are located well above the lower edges of the slides, and the later extend down below the rails 21 on the outside of the rails, thus confining the carriage 1 laterally on the rails 21. Each of the slides has a rail-clamping jaw 37 at its lower end extending inwardly underneath the respective rail carrying a pair of adjustable clamp screws 39 for varying the distance D (as shown in FIG. 5) that clamping jaw 37 must move for clamping purposes. Clamp screws 39 are adapted to engage the lower face 21a of the respective rail 21 on the outside of the channel 19.

The actuating means 9 comprises a first shaft 41 extending horizontally between the angles 17 adjacent the vertical channel 11 and a second shaft 43 extending horizontally between the angles 17 adjacent the other channel 13. Each shaft is journalled adjacent its ends in holes in the vertical legs of the angles 17 and extends beyond the angles 17. The shafts 41 and 43 are interconnected for conjoint rotation by means indicated generally at 45 comprising a link 47 pin-connected at its ends as indicated at 49 to cranks 51 on the shafts. Shaft 41 extends outward through an opening 53 in the slide 23*a* and the second shaft 43 similarly extends outward through an opening 53 in the slide 25*a* at what may be referred to as the front of the carriage. These openings 53 are sufficiently large to permit up and down movement of the two front slides 23*a* and 25*a* relative to the carriage 1. Each of the shafts 41 and 43 carries, adjacent each end thereof, a cam 55 which is rotary with the shaft between upper and lower cam follower lugs 57 and 59 on the inside of a respective slide. Pedals 61 and 63 are secured to the forward ends of the shafts 41 and 43. These pedals are 180° out of phase (see FIG. 2), pedal 63 being up when pedal 61 is down, and vice versa. Each cam 55 is so developed that when rotated from a first to a second angular position, it raises the respective slide 23*a* or *b*, 25*a* or *b* relative to the carriage 1 and when rotated back to its first position, it lowers the slide relative to the carriage.

When pedal 63 is up and pedal 61 is down, the cams are in their first position with the slides in a down position relative to the carriage (FIG. 4). With the slides in their down position, the rollers 33 are in engagement with the top surfaces 21*b* of rails 21. The clamp jaws 37 with the screws 39 are in a down position, clear of the lower surfaces 21*a* of the rails 21. The carriage 1 is in a raised free position clear of the rails. Thus, the carriage may be readily rolled to any desired position of adjustment along the track 3 via the rolling of the rollers 33 on the rails 21. When the carriage has been moved to the desired position, the operator steps down on the up pedal 63. This results in rotation of the two shafts 41 and 43 and all four cams 55 to effect lowering of the carriage relative to the slides to the clamping position of FIG. 3 wherein it engages the track (i.e., the lower ends 11*a* and 13*a* of channels 11 and 13 engage the rails 21). When the carriage engages the rails 21, continued rotation of the cams 55 by the pedal 63 as it is pushed down by the foot to its lowered position effects raising of the slides 23*a*, *b* and 25*a*, *b* to lift the rollers 33 clear of the rails and lift the clamp jaws 37 with the screws 39 into clamping engagement with the bottom 21*a* of the rails. At the same time as pedal 63 is swung down (by the foot), pedal 61 swings up. It is to be noted that the clamping operation will not cause any movement of the carriage along the track and that the carriage will remain in the position along the track to which it was rolled.

To unclamp the carriage, the operation is reversed. The pedal 61 (now up) is pushed down by the foot, resulting in rotation of the cams 55 to effect lowering of the slides 23*a*, *b* and 25*a*, *b* to the point where the rollers 33 engage the top of the rails 21, and clamp jaws 37 with the screws 39 disengage from the bottoms of the rails. Continued rotation of the cams by the pedal 61 as it continues to be pushed down by the foot effects raising of the carriage off the rails to the free carriage position (FIG. 4). At the same time, pedal 63 (which was down) swings back up to its raised position of FIG. 2 for the subsequent clamping operation.

FIGS. 7–12 illustrate a modification, particularly for a carriage 71 corresponding to the base 311 of the hydraulic press shown in U.S. Pat. No. 3,068,483. The carriage has roller means 73 adapted to roll on track 75 for rolling the carriage to different positions of adjustment therealong and adapted to be clamped in any adjusted position on the track. Here the track comprises a pair of channels 77 and 79 mounted on the floor with

their webs vertical, with the upper flanges of the channels extending inwardly toward each other, with the upper flange of channel 77 carrying a V-rail 78 constituting a rail surface for carriage guiding purposes as will appear, and with the upper flange of channel 79 constituting another rail surface. The roller means is adapted to roll on the rail surfaces, and the carriage and the roller means are relatively movable as will appear for movement of the carriage between a free position clear of the track (as shown in FIG. 9) with the roller means in engagement with the track and supporting the carriage for rolling along the track, and a clamping position in engagement with the track (shown in FIG. 10) with the roller means clear of the track. At 81 is generally indicated actuating means operable starting with the carriage in its free position and the roller means in engagement with the track for effecting movement of the carriage to its clamping position and then moving the roller means clear of the track. Means 81 is reversely operable starting with the carriage in its clamping position and the roller means clear of the track for effecting movement of the roller means into engagement with the track and then moving the carriage to its free position. Clamp means generally indicated at 83 is operable by the actuating means 81 for clamping the carriage to the track when the carriage is moved to its clamping position and for unclamping the carriage from the track when the carriage is moved to its free position.

The carriage 71 comprises a rectangular base plate 85 having reinforcing bars 87 welded to its bottom extending longitudinally adjacent its sides. A pair of bearing members 89 for a first cross shaft 91 extend out endwise from one end of the plate 85 adjacent its respective corners, and a second pair of bearing members 93 for a second cross shaft 95 extend out endwise from the other end of the plate 85 adjacent its other two corners, all these bearing members being welded to bars 87. Blocks 97 and 97*a* are secured as by welding to the bottom of base plate 85 adjacent its corners for engagement with the upper flanges of channels 77 and 79. Blocks 97*a* provided on the side of the carriage adjacent channel 77 are grooved for engagement with the V-rail 78.

Shaft 91 is journalled at its ends in bearings 89 extending laterally of the carriage 71 at one end thereof below the level of the carriage base plate 85. Similarly, shaft 95 is journalled at its ends in bearings 93 extending laterally of the carriage at the other end thereof below said level. A disk cam 99 is secured to each end of each shaft by a dowel pin 101 and a capscrew 103 outwardly of the respective bearing with the axis of the disk cam offset from the shaft axis. Each of the shafts 91 and 95 has a tapped hole 105 extending inwardly from each end thereof, these holes being aligned on an axis offset from the shaft axis, and each disk cam 99 has a hole 107 registering with a respective hole 105. The roller means 73 comprises rollers bearing this same number rotatable on screws 109 extending through holes 107 and threaded in tapped holes 105 in the shaft ends. The rollers on the side of the carriage adjacent channel 77 are grooved as indicated at 73*a*, for engagement with the V-rail 78. The actuating means 81 includes the shafts 91 and 95, each of which has a folding handle 111 for rotating it. The handle is pivotally mounted on the shaft by means of a pin connection such as indicated at 112. The clamp means 83 includes four clamp members 113 each movable up and down by a respective disk cam 99. Each of these clamp members comprises a rectangular plate having a circular cam opening 115 receiving the respective disk cam, the latter having a flange 117 holding the plate thereon, and a lower outwardly directed clamp jaw 119 which extends underneath the upper flange of the respective channel and which has clamp screws 121 adjustably threaded therein for engaging the bottom of the upper flange when the clamp member is moved upwardly. Clamp screws 121 may be adjusted to vary the distance S (as shown in FIG. 9) that clamp jaw 119 must move for clamping engagement purposes.

Each of shafts 91 and 95 is adapted to occupy a first angular position in which the clamp members are down and the rollers 73 are down in engagement with the rails (see FIG. 9). The carriage 71 then occupies a raised free position wherein the blocks 97 and 97*a* are above and clear of the rail surfaces. Thus, the carriage 71 may be readily rolled to any desired position of adjustment along the track 75 via rolling of the rollers 73 on their respective rail surfaces. When the carriage has been moved to the desired position, the operator rotates the shafts 91 and 95 in the direction to effect lowering of the carriage to the point where the blocks 97 and 97*a* on the bottom of the carriage engage the rail surfaces. On continued rotation, the rollers 73 are lifted clear of the rail surfaces; and each clamp members 113 is moved upward by its respective disk cam 99 for clamping engagement of the screws 121 with the bottom of the upper flanges of the channels 77 and 79 (see FIG. 10).

To unclamp the carriage 71, the shafts 91 and 95 are rotated in the opposite direction to effect raising of the carriage and the blocks 97 and 97*a* off the rail surfaces, lowering of rollers 73 into engagement with the rail surfaces, and lowering of the clamp members 113 to their unclamped position of FIG. 9.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As various changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. A carriage supported by roller means for rolling the carriage on a track to different positions along the track, means for clamping said carriage to the track including a clamp member movable relative to the carriage, and actuating means operable for moving the carriage and the clamp member between an unclamped position in which the carriage and the clamp member are separated from one another and clear of the track with the roller means in engagement with the track and a clamped position in which the clamp member and the carriage are in gripping engagement with opposite surfaces of the track for locking the carriage against movement relative to the track and the roller means is substantially free of clamping stress, said actuating means being reversely operable for moving the carriage and

the clamp member from their clamped position to their unclamped position.

2. A carriage as set forth in claim 1 wherein said roller means is movable relative to said carriage and the actuating means is further operable for moving the roller means clear of the track while said carriage and clamp member are in their clamped position.

3. A carriage supported by roller means for rolling the carriage on a track to different positions along the track, said carriage and said roller means being movable relative to one another for movement of the carriage between a free position in which the carriage is clear of the track with the roller means in engagement with the track for rolling of the carriage along the track and a clamped position in which the carriage is in engagement with the track and the roller means is substantially free of clamping stress, actuating means operable starting with the carriage in its free position and with the roller means in engagement with the track for effecting movement of the carriage to its clamped position and reversely operable starting with the carriage in its clamped position for effecting movement of the carriage to its free position, and clamp means operable by said actuating means for clamping the carriage to the track when the carriage is moved to its clamped position and for unclamping the carriage from the track when the carriage is moved to its free position.

4. A carriage as set forth in claim 3 operable on a track having one surface for engagement by the roller means and a generally oppositely facing surface for engagement by said clamp means.

5. A carriage as set forth in claim 3 wherein said actuating means is further operable starting with the carriage in its free position and with the roller means in engagement with the track for effecting movement of the carriage to its clamped position and then moving the roller means clear of the track, said actuating means being reversely operable starting with the carriage in its clamped position and the roller means clear of the track for effecting movement of the roller means into engagement with the track and then moving the carriage to its free position.

6. A carriage as set forth in claim 5 wherein the roller means comprises rollers carried by and movable with the clamp means and wherein the carriage and clamp means are relatively movable.

7. A carriage as set forth in claim 3 operable on a track comprising a pair of spaced rails having upper and lower surfaces, said clamp means comprising a first pair of clamp members mounted for vertical sliding movement on the sides of the carriage outside the rails adjacent one end thereof and a second pair of clamp members mounted for vertical movement at the sides of the carriage outside the rails adjacent the other end of the carriage, each clamp member having a lower clamp jaw extending inwardly underneath and cooperable with the lower surface of a respective rail, said roller means comprising a roller on the inside of each clamp member engageable with the upper surface of a respective rail.

8. A carriage as set forth in claim 7, said actuating means comprising a first shaft extending crosswise of the carriage having cam means thereon for raising and lowering the first pair of clamp members relative to the carriage and a second shaft extending crosswise of the carriage having cam means thereon for raising and lowering the second pair of clamp members relative to the carriage.

9. A carriage as set forth in claim 8, having means interconnecting the shafts for conjoint movement, and wherein each shaft has a pedal on one end thereof, with the pedals out of phase so that one is up when the other is down and vice versa.

10. A carriage as set forth in claim 5 operable on a track comprising a pair of spaced rails having upper and lower surfaces, said carriages having a pair of shafts extending crosswise of the carriage, with said roller means comprising rollers mounted on the ends of the shafts with their axes offset from the shaft axes for up and down movement of the rollers toward and away from the track and for movement of the rollers relative to the carriage upon rotation of the shafts for effecting movement of the carriage from its clamped position to its free position and vice versa, and cam means on the shafts for movement of the clamp means toward and away from the track, said clamp means comprising clamp members carried by the cam means for up and down movement relative to the carriage each having a lower clamp jaw extending underneath and cooperable with the said lower track surface.

11. A carriage as set forth in claim 10 wherein the cam means comprises cams secured to the shafts adjacent the rollers and the ends of the shafts, said clamp members having cam openings receiving said cams.

12. A carriage as set forth in claim 11 wherein each cam is a disk secured to the respective shaft end with the axis of the disk offset from the shaft axis.

13. A carriage as set forth in claim 12 wherein the shafts have folding handles.

14. A carriage as set forth in claim 4 wherein said clamp means comprises clamp members each having a clamp jaw extending underneath and cooperable with said generally oppositely facing track surface, each of said clamping jaws having adjustable means for varying the distance the clamping jaw must move for engagement with said generally oppositely facing track surface.

* * * * *

PO-1050
(5/69)

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,687,239 Dated August 29, 1972

Inventor(s) Walter G. Moehlenpah and Dennis G. Farnsworth

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 4, line 17, "63" should read --61--, and "61" should read --63--; line 29, "63" should read --61--; line 35, "63" should read --61--; line 40, "63" should read --61--; line 41, "61" should read --63--; line 47, "61" should read --63--; line 52, "61" should read --63--; line 55, "63" should read --61--; Fig. 4 (upper left), "63" should read --61--.

Signed and sealed this 29th day of May 1973.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents