June 15, 1965 N. V. G. LUNDGREN ETAL 3,188,659

MEDICAL TREATING TABLE EQUIPMENT

Filed July 11, 1962 2 Sheets-Sheet 1

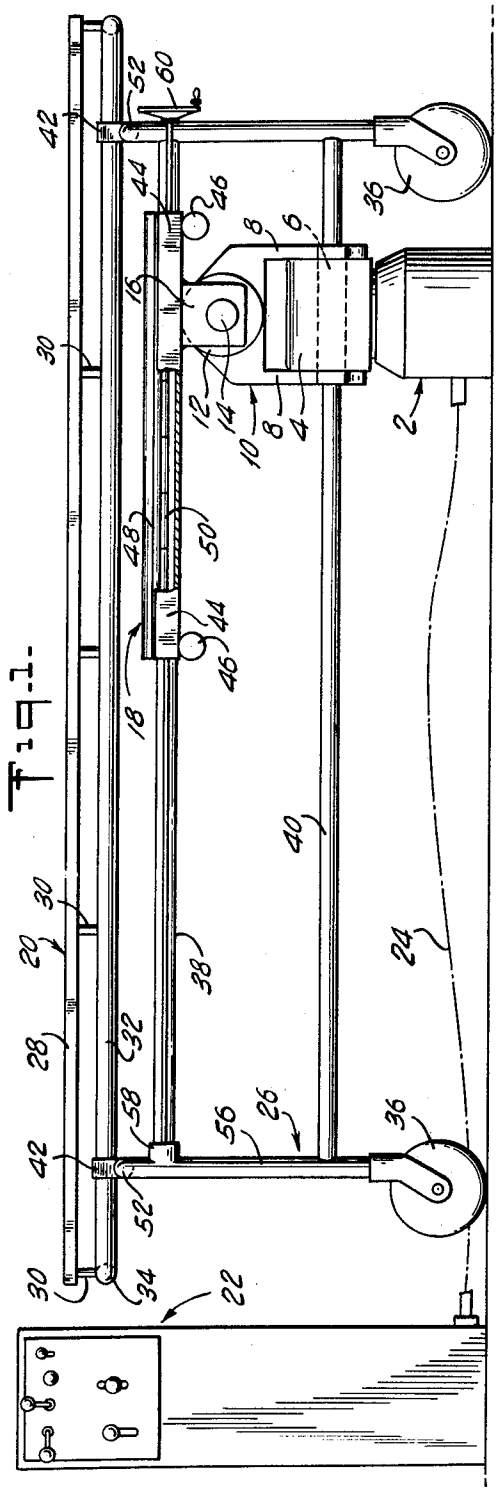


Fig. 1.

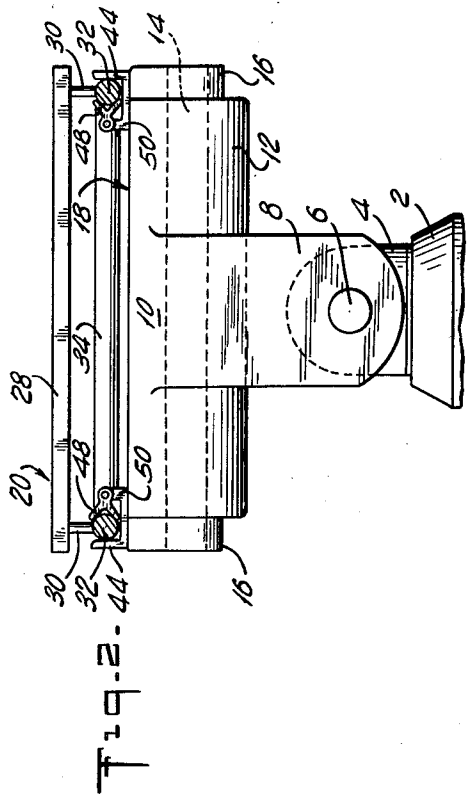


Fig. 2.

INVENTORS
NILS VIKTOR GEORG LUNDGREN
STIG BORJE SIXTEN PETTERSSON
BY
Nolte & Nolte
ATTORNEYS

June 15, 1965 N. V. G. LUNDGREN ETAL 3,188,659

MEDICAL TREATING TABLE EQUIPMENT

Filed July 11, 1962 2 Sheets-Sheet 2

Fig. 3.

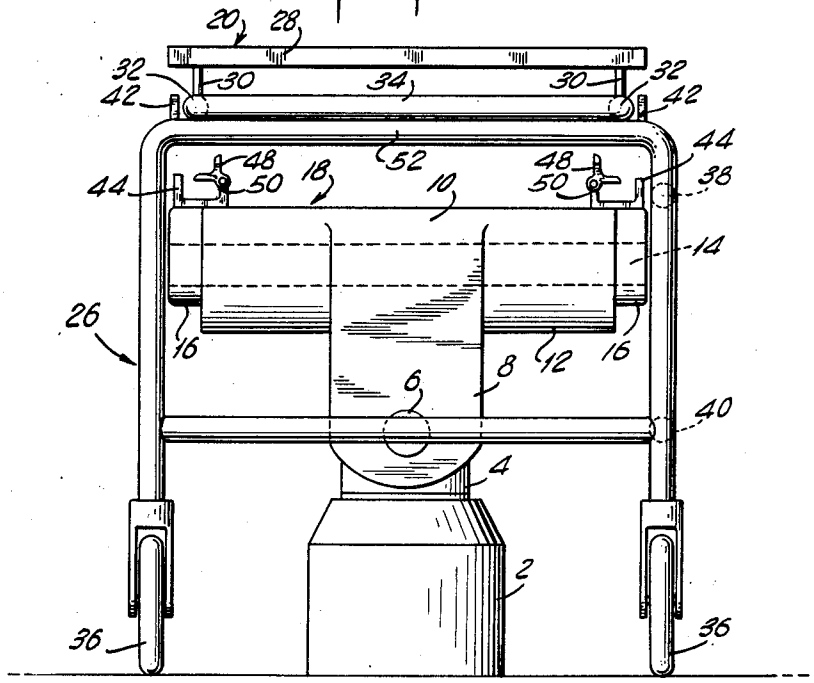
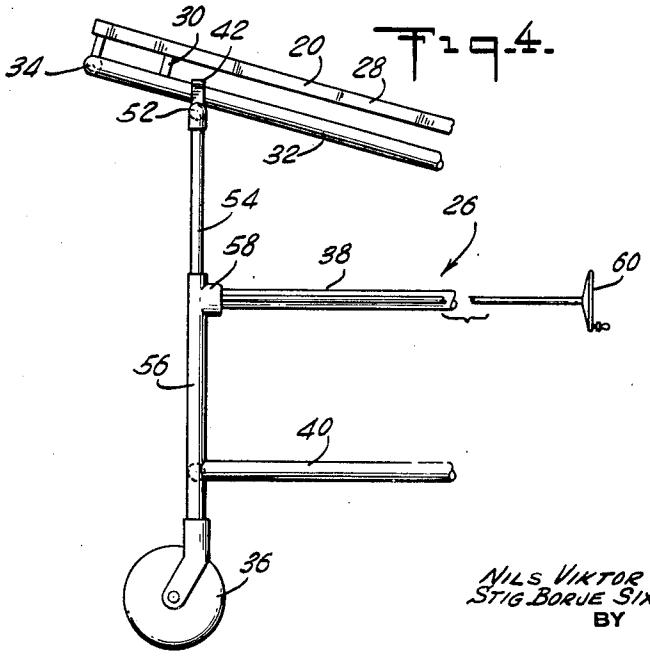


Fig. 4.



INVENTORS
NILS VIKTOR GEORG LUNDGREN
STIG BORJE SIXTEN PETTERSSON
BY
Nolte & Nolte
ATTORNEYS

United States Patent Office 3,188,659 Patented June 15, 1965

3,188,659

MEDICAL TREATING TABLE EQUIPMENT

Nils Viktor Georg Lundgren, Stockholm, and Stig Börje Sixten Pettersson, Bandhagen, Sweden, assignors to Kirurgiska Instrument Fabriks Aktiebolaget KIFA, Solna, Sweden, a corporation of Sweden

Filed July 11, 1962, Ser. No. 209,207
Claims priority, application Sweden, July 20, 1961, 7,495/61; Germany, Apr. 18, 1962, A 39,989
12 Claims. (Cl. 5—86)

The present invention relates to a medical treating table equipment such as an operating or X-ray, or a combined operating and X-ray table equipment comprising a treating-table structure, a carriage and a detachable treating-table lying plate adapted to be transferred from the carriage onto the table structure and back. Such an equipment enables a patient to be transported between a bed hall and various treating rooms—operating room, X-ray room, narcosis room, wakening room—without transfer of the patient from one lying surface to another.

It is an object of the invention to provide an equipment of the aforesaid type enabling the lying plate to be directly transferred from the carriage onto the table structure (which may be stationary or mobile) and back on the shortest way and without any intervening shifting movement of the lying plate independently of both of said carriage and table structures.

It is a further object of the invention to provide a medical treating table equipment in which the lying plate can be constantly maintained in a position which is desirable in respect to the condition of the patient both on the table and on the carriage as well as during the transfer between the carriage and table structures.

Other objects, the novel features as well as the attendant advantages of the invention will be appreciated and more fully understood with reference to the following detailed description, when considered with the accompanying drawings.

By way of example an embodiment of the invention is described in greater detail with reference to the drawings, it being noted that mainly such parts of the equipment are shown and described which embody novel features of the invention, it being understood that in all other respects the equipment and its individual parts are of conventional design.

In the drawings:

FIG. 1 is a side elevation of the inventive table structure, showing the carriage and the lying plate as well as the table substructure, with a few parts omitted for the sake of clarity;

FIG. 2 is a partial end view of the table structure;

FIG. 3 is an end view of the carriage with the lying plate in a transfer position above the table substructure; and

FIG. 4 is a partial side elevation similar to that of FIG. 1 of the table structure alone, shown in a raised position.

As best shown in FIGS. 1 through 3, the table substructure comprises a foot portion 2, stationary or mobile, supporting a vertically reciprocable column 4. A shaft 6 is journaled in column 4 near the upper free end thereof. The ends of shaft 6 extending from either side of column 4 support each one of legs 8 of a bracket 10 having a tubular body portion 12 in which a shaft 14 is journaled at right angles to shaft 6. The ends of shaft 14 exending from the ends of the portion 12 each support a depending side support plate 16 forming part of a rectangular frame 18 which is thus supported for universal tilting movement on and with respect to foot 2 and column 4. Shaft 6 extends longitudinally and shaft 14 transversely with respect to frame 18. The latter is adapted to carry a treating-table lying plate 20 complementing the

described treating-table substructure to form a complete treating table such as an operating or an X-ray table.

The tilting movement of bracket 10 about shaft 6, the tilting movement of frame 18 about shaft 14, and the lifting and lowering of column 4 are performed with the aid of any known driving means and driving media, such as by pneumatic, hydraulic, electric or manual means or any combination of such means.

Of course, all movable parts are adapted to be latched in any adjusted position. Conventional drive control means are provided on the foot of the table structure or on an independent control panel, control desk or the like, said control means being connected, e.g., by cables.

The embodiment of the inventive equipment in which the number of the relatively movable and comparatively independent parts which together form the equipment is increased from three to four offers important advantages insofar as the table substructure is relieved, the ground freedom is improved and an additional safety factor is introduced by the remote control, in that inadvertent actuation of the control means at the operating or other treating table proper is avoided.

In a preferred embodiment a control board, adapted to be built into the wall of the operating or X-ray room, and generally identified in FIG. 1 by numeral 22, while its connecting cable is denoted 24, is provided with three manually and/or electrically operable valves for lifting and lowering the frame and tilting the same in the longitudinal and transverse directions, respectively.

These valves may also be arranged in such a way as to be actuated from an arm extending from the ceiling or wall of the room and so journalled and articulated that adjustment of the position of the patient may be performed selectively from positions at the head or foot ends of the lying plate. The control board 22 or the like is preferably provided with one or more valves enabling the various actuating valves to be by-passed so that in an emergency situation, e.g. failure of electric power supply, the position of the patient may be manually adjusted.

The lying plate 20 shown in FIG. 2 in position on the table substructure, and in FIGS. 1 and 3 in position on a carriage 26, has a lying surface 28 of arbitrary construction and comprising material not absorbing X-ray radiation. The surface 28 or substrate, supporting the body of the patient on the lying plate 20, is attached to the latter in any conventional way. The lying suface 28 is supported in any suitable way, such as by short rods 30 located slightly above and connected to a frame comprising longitudinally extending tubes or rods 32 and transversely extending tubes or rods 34.

The carriage 26 is a structure borne by wheels 36, consisting of tubes or rods and being reinforced on both transverse ends as well as on one long side (to the right-hand side in FIG. 3) by respective upper and lower horizontal struts 38, 40 which, however, are absent on the other long side. On this latter side the carriage thus may be freely moved over the table substructure. On the upper side of the transverse ends the carriage is provided with upwardly projecting abutments 42 preventing the lying plate 20 from being laterally displaced on the carriage. The lying plate has a greater length than the carriage 26 which, in turn, has a greater long-side length than the frame 18 of the table substructure.

Frame 18 on the long sides comprises upwardly open U-beams 44 which are interconnected by transverse rods or tubes 46 and which are spaced from each other a distance corresponding to the spacing between rods or tubes 32 of the lying plate so that the latter can be placed on the table structure by inserting tubes 32 into U-beams 44. As tubes 32 are of greater length than the U-beams 44, the lying plate 20 may be inserted in different longitudinal

positions in which it is more or less free-bearing in relation to the support **2**.

Certain freedom in the positioning of the lying plate on the table substructure in the longitudinal direction is desirable in order to enable the one or the other end of the plate to be disposed to a higher degree free-bearing in relation to the foot or support of the equipment, and thus more easily accessible. Additional free ground space resulting from this arrangement may, for example, be of great value for the purpose of X-ray photography or with regard to continuous X-ray control during an operation.

Generally, and particularly when the lying plate is mounted on the table substructure in a cantilever fashion, it is desirable to provide safety means counteracting any tendency toward inadvertent release of the mutual engagement between the engaging members, i.e., tilting or turning over of the lying plate with respect to the table. Moreover, it is desirable that the safety means are automatically brought into action in any position of insertion of the lying plate on the table substructure. Finally it is desirable that the safety means do not offer any resistance to the removal of the lying plate from the table.

A safety device which prevents any movement of the rods **32** inserted into the U-beams **44** other than a vertical separation is shown FIGS. 2 and 3. This device comprises a pair of angle-profile elements **48** each being pivotally mounted at the apex edge thereof by a hinge member **50** or the like on the upper edge of the inner flange of each of the U-beams **44**. The said inner flanges have somewhat lesser height than the outer flanges. By springs not shown the angle-profile elements **48** are biased to the position shown in FIG. 3. When rod **32** enters into the groove of the U-beam **44**, the normally horizontal lower flange of the angle-profile element **48** is disposed in the path of movement of the rod **32**, whereby the angle-profile element is turned against the action of its spring to a position shown in FIG. 2. In this position its both flanges embrace the inner side of rod **32** whereas the outer side of this rod abuts against the inner surface of the outer flange of U-beam **44**. In this position the angle-profile element **48** effectively opposes any change of position of rod **32** in relation to the U-beam **44** other than a vertical lifting movement.

This locking or safety device in a very simple way precludes any tilting movement of the lying plate **20** in relation to the frame **18** about a transverse axis even when the lying plate is supported in a cantilever fashion on the table frame. Inadvertent separation of rod **32** on one of the long sides from the corresponding U-beam **44**, while engagement between the other rod **32** and the other U-beam **44** is maintained, can be precluded by positively coupling the swinging movement of both angle profiles of elements **48**. Additional, automatically or manually operated latching devices may be provided for safety reasons.

The transfer of the lying plate **20** from the carriage **26** onto the table substructure is performed by moving the carriage with its open side over the table substructure to a predetermined plate-transferring position which preferably is determined by abutment of the upper lateral strut **38** of the carriage against the outer surface of adjacent U-beam **44**, or depending on the position of elevation of the frame **18** of the table substructure against the adjacent side support plate **16** of the frame. In the initial plate-transferring position shown in FIG. 3, the rods **32** are thus disposed above the U-beams **44**. The adjusted position in the longitudinal direction can be chosen at will within wide limits determined by the difference in lengths between the rods **32** and the frame **18**. By lifting the frame on the column **4**, the lying plate **20** is lifted from the carriage and engaged with the table substructure. The carriage is then removed. The transfer of the lying plate **20** from the table substructure onto the carriage is performed in reverse order by lowering frame **18** on column **4** after the carriage has been positioned over the table substructure into the predetermined receiving position.

If a table substructure is used in which a support carries a frame for vertical reciprocation, such frame being pivotable about a horizontal axis and preferably universally tiltable, and adapted to be locked in any desired tilting position, advantageously also the carriage will be made tiltable in a way corresponding to the tiltability of the frame. In this manner the lying plate can be advanced to or removed from the table in a position correspnding to the actual tilting position of the frame on the support.

Thus, a patient who is resting on the lying plate which is supported by the carriage may already be placed in a position which is desirable for medical reasons and may be transferred onto the operating table and from there again onto the carriage while the said desirable position is invariably maintained.

With the aid of an arrangement provided on the carriage **26** shown in FIG. 4, the lying plate **20** is adjustable to a desired tilting position so that upon corresponding tilting of the frame **18** the patient, without change of position, may be transported on the carriage to the table substructure, onto the table substructure and again back onto the carriage. The rods **32** of the lying plate **20** are supported between the vertically extending abutments **42** on transverse rods **52** of the carriage, as shown in FIGS. 1 and 3. In the embodiment shown in FIG. 4 the transverse rod **52** at one end of the carriage is rigidly connected to the upper end of rods **54** which are telescopically received in corner posts **56** at said end of the carriage **26**. The vertical position of rods **54** in posts **56** is adjusted with the aid of a suitable mechanical transmission **58** of any known type actuated by means of a hand wheel **30**. The actuating mechanism may, of course, also be a hydraulic or pneumatic one. For the sake of clarity, the transmission **58** and the wheel **60** have not been shown in FIG. 3.

In the various embodiments as described above it is, of course, immaterial on which parts of the equipment the individual engaging members are applied. While, as a rule, the receiving or female engaging members, such as U-profiles, are disposed on the table structure and the entering or male engaging members, such as rods, are disposed on the lying plate—this arrangement offering advantages with regard to the mounting of the lying plate on the carriage, profile beams, such as U-profiles, may be provided on the lower face of the lying plate for co-operation with rods provided on the upper face of the table substructure.

Also, it is not necessary that the engaging members of the table be of lesser length than those of the plate; the reverse disposition is also within the scope of the invention.

The foregoing disclosure relates only to preferred embodiments of the invention which are intended to include all changes and modifications of the examples described within the scope of the invention as set forth in the appended claims.

What we claim is:

1. A medical treating-table equipment comprising a treating-table substructure, a carriage, plate-supporting means provided on said carriage and vertically reciprocable plate-supporting means provided on said table substructure, and a treating-table lying plate adapted to be selectively supported on said supporting means, said carriage having a wheel-supported frame continuously open on the top and on one side, said table substructure and said frame being dimensioned to enable the latter to be moved horizontally with said one side leading to a predetermined plate-transferring position in which said table substructure is disposed within said frame with said supporting means of the carriage positioned substantially in vertical alignment with said plate-supporting means of the table substructure, said table substructure being provided with means for elevating said supporting means of the table substructure when said frame is in said transferring

position, so as to perform a transfer function by vertically lifting said plate from said carriage and by alternately lowering the same for being verically deposited onto said carriage.

2. A table equipment as claimed in claim 1, further comprising control means for said elevating means, arranged on a separate unit spaced from said table substructure and permitting remote control of said transfer of the plate between said carriage and said table substructure.

3. A medical treating-table equipment comprising a treating-table substructure, a carriage, plate-supporting means provided respectively on said carriage and on said table substructure, and a treating-table lying plate adapted to be transferred between said supporting means, said carriage being continuously open on the top and on one of its sides to an extent corresponding to the dimensions of said table substructure so that said carriage may be moved into a position over said table substructure, said plate and said table substructure being provided with mutually opposed complementary engaging means adapted to be brought into engagement by a relative approaching movement between said supporting means of the table substructure and the plate supported on said supporting means of the carriage above said table substructure, and means on either of said carriage and said table substructure for performing said approaching movement and a reverse separating movement.

4. A table equipment as claimed in claim 3, wherein said engaging means of the plate are directed downwardly and those of the table substructure are directed upwardly, said movement-performing means acting to bring about said approaching movement in a vertical direction between said plate and said table substructure.

5. A table equipment as claimed in claim 3, wherein said carriage is provided with engaging means opposed to and adapted to coact with said engaging means of the plate.

6. A table equipment as claimed in claim 3, further comprising a frame for said carriage, and wherein said engaging means are elongated elements extending parallel to a pair of opposite sides of said frame, said engaging means of the plate having a greater length than the length of the table substructure along said opposite sides, thereby permitting said engagement between the engaging means in various positions of relative displacement of said table substructure and said plate along said opposite sides.

7. A medical treating-table equipment comprising a treating-table substructure, a carriage, and a substantially rectangular treating-table lying plate adapted to be transferred between plate-supporting means provided respectively on said table substructure and on said carriage, the latter being continuously open on the top and on one of its sides to an extent corresponding to the dimensions of said table substructure so that said carriage may be moved into a position above said table substructure, said plate being provided along its long sides with elongated, downwardly projecting engaging elements for cooperation with complementary, upwardly projecting open-channeled engaging elements provided on said supporting means of the table substructure, the respective engaging elements being adapted to be brought into engagement by a relative approaching movement between said supporting means of the table substructure and said plate supported on said supporting means of the carriage above said table substructure, and means on either of said carriage and said table substructure for performing said approaching movement and a reverse separating movement.

8. A medical treating-table equipment comprising a treating-table substructure and a treating-table lying plate adapted to be temporarily placed on said table substructure, said plate and said table substructure being provided with opposed, complementary engaging members adapted to be brought into engagement by a relative approaching movement in a predetermined direction between said plate and said table substructure, latching means on said table substructure acting to prevent said engaging members from becoming inadvertently disengaged, said latching means permitting engagement and disengagement of said engaging members only when exposed to the action of the latter moving in said predetermined direction and the reverse direction.

9. A medical treating-table equipment comprising a treating-table substructure and a treating-table lying plate adapted to be temporarily placed on said table substructure, said plate and said table substructure being provided with opposed, complementary engaging members adapted to be brought into engagement by a relative approaching movement in a predetermined direction between said plate and said table substructure, a latching profile element hingedly attached to said table substructure adjacent said engaging members thereon said profile element having two projecting portions substantially at right angles with respect to one another and a hinge portion therebetween, said profile element being mounted in such a position that one of said projecting portions is at any time positioned in the path of said relative movement of said plate, whereby said profile element will be turned about said hinge portion into a final position which is attained as soon as the respective complementary engaging members have come into complete engagement and in which the other one of said projecting portions will prohibit any relative movement between said engaging members of the plate and the table substructure, other than a lifting movement corresponding to said relative movement and performed in a direction opposite to said predetermined direction.

10. A medical treating-table equipment comprising a treating-table substructure, a carriage and a treating-table lying plate adapted to be transferred between plate-supporting means provided respectively on said table substructure and on said carriage, the latter being continuously open on the top and on one of its sides to an extent corresponding to the dimensions of said table substructure so that said carriage may be moved into a position over said table substructure, said plate and said table substructure being provided with opposed, complementary engaging means adapted to be brought into engagement by a relative vertical approaching movement between said supporting means of the table substructure and the plate supported on said supporting means of the carriage, means on either of said carriage and said table substructure for performing said approaching movement and a reverse separating movement, and abutment means on said carriage and said table substructure for limiting the position to which said carriage must be moved over said table substructure in order that said plate assume a position in relation to said table substructure in which the opposed ones of said engaging means will come into engagement when said approaching movement is performed.

11. A medical treating-table equipment comprising a treating-table substructure, a carriage substructure and a treating-table lying plate adapted to be transferred between plate-supporting means provided respectively on said table substructure and said carriage substructure, the latter being continuously open on the top and on one of its sides to an extent enabling said carriage substructure to be moved to a position over said table substructure, said plate and said substructure being provided with opposed complementary engaging means adapted to be brought into engagement by a relative approaching movement between said supporting means of one of said substructures and the plate supported on the other one of said substructures, means on one of said substructures for performing said approaching movement, means on said table substructure for adjusting the supporting means thereof to a position of tilting about a horizontal axis, means on said carriage substructure for adjusting the supporting means thereof to any corresponding position of tilting about a horizontal axis, and means for latching

said supporting means in the respective adjusted tilting positions.

12. A table equipment as claimed in claim 11, wherein said supporting means of the carriage substructure comprises spaced horizontal bars adapted to support one end of said plate, one of said bars being mounted for vertical reciprocation on said carriage substructure.

References Cited by the Examiner

UNITED STATES PATENTS

2,014,244	9/35	Bramlett	5—81
2,035,321	3/36	Koenigkramer et al.	5—81
2,831,201	4/58	Limbach	5—86 X

FRANK B. SHERRY, *Primary Examiner.*