

April 9, 1940.

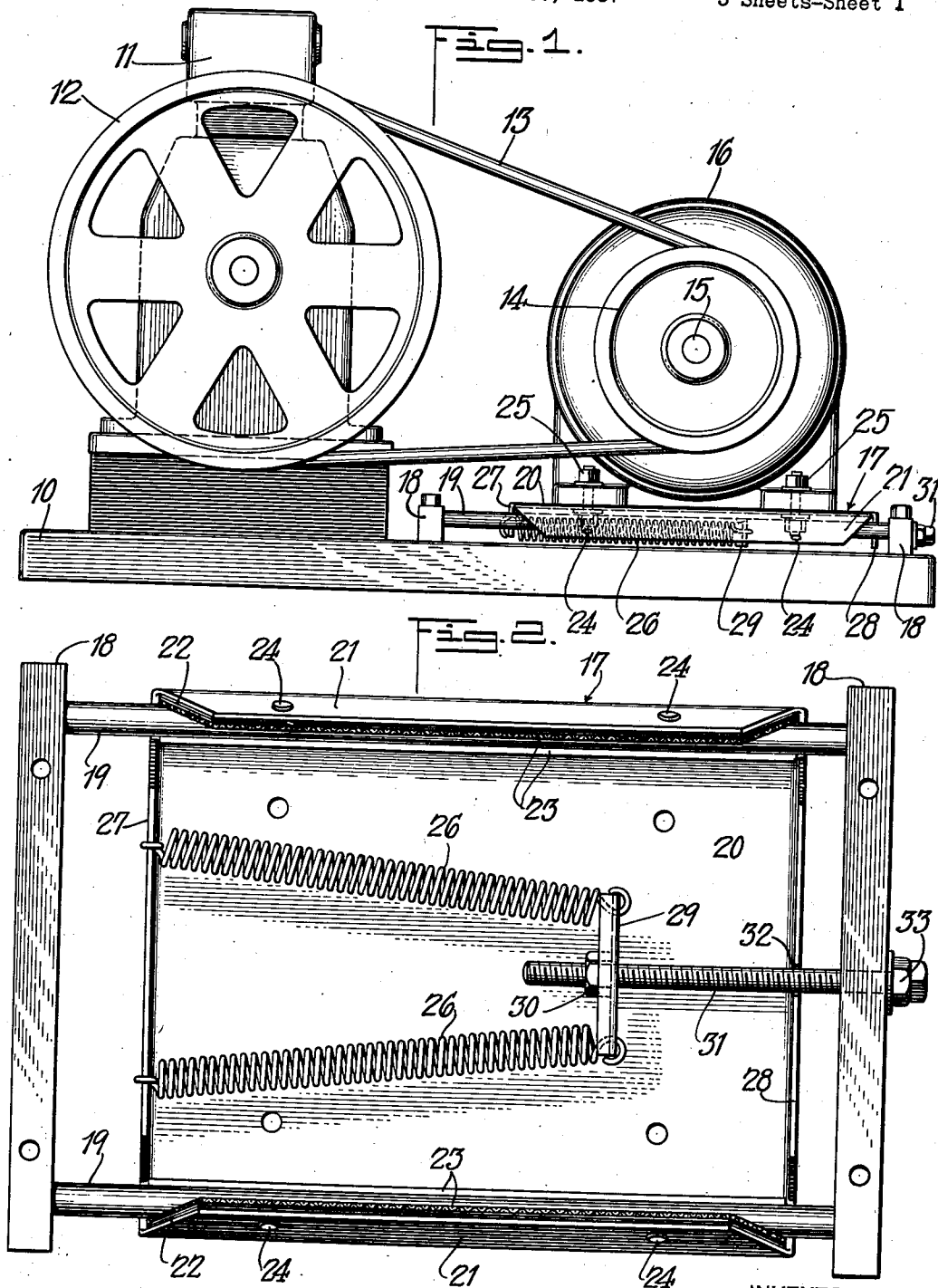
A. J. BERNDT

2,196,892

SUPPORT

Filed Nov. 30, 1937

3 Sheets-Sheet 1



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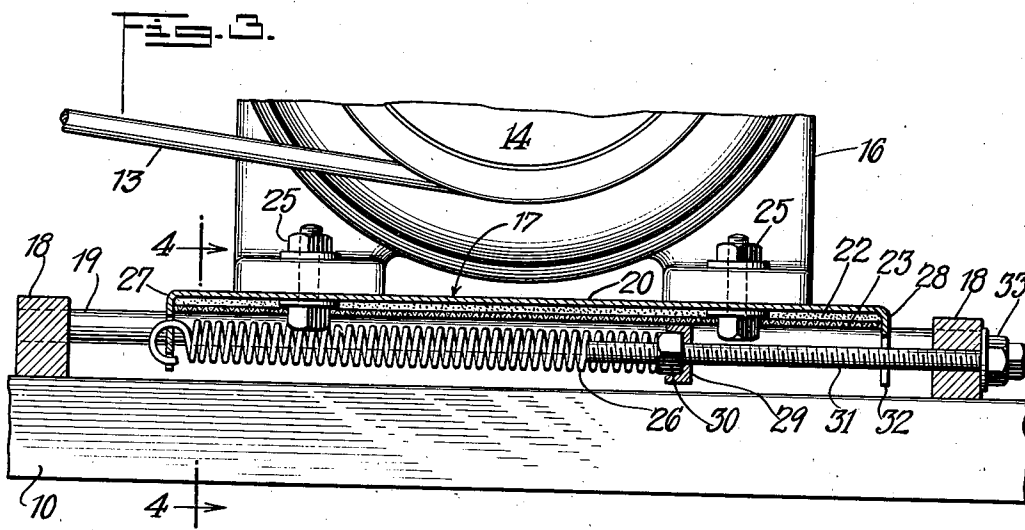
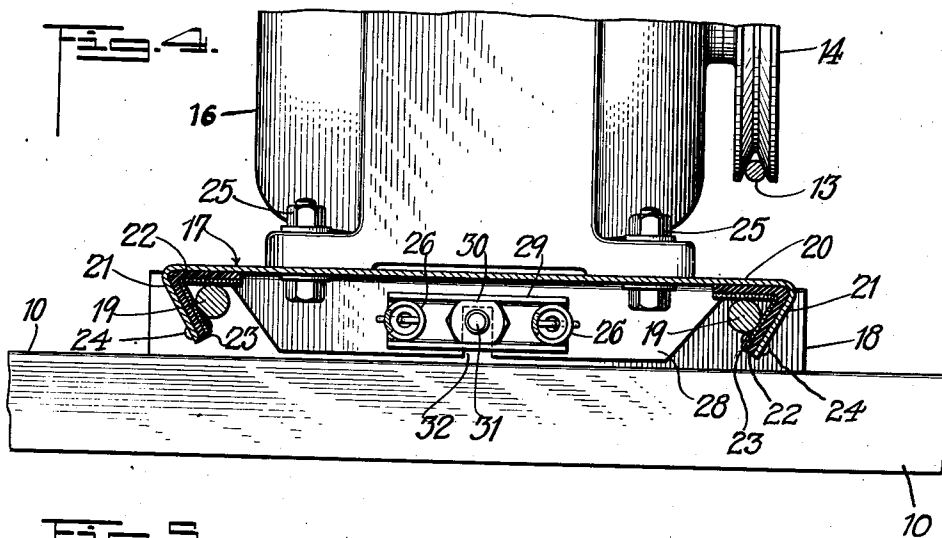
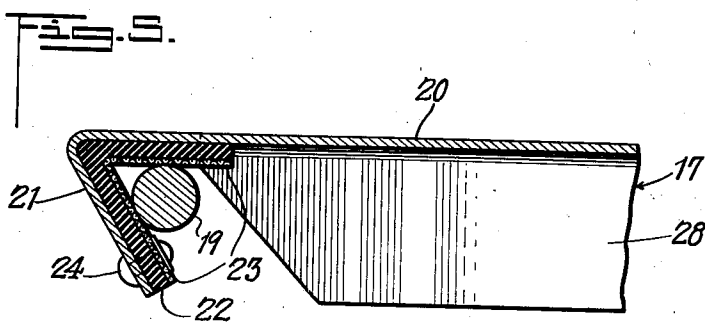
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3 Sheets-Sheet 2



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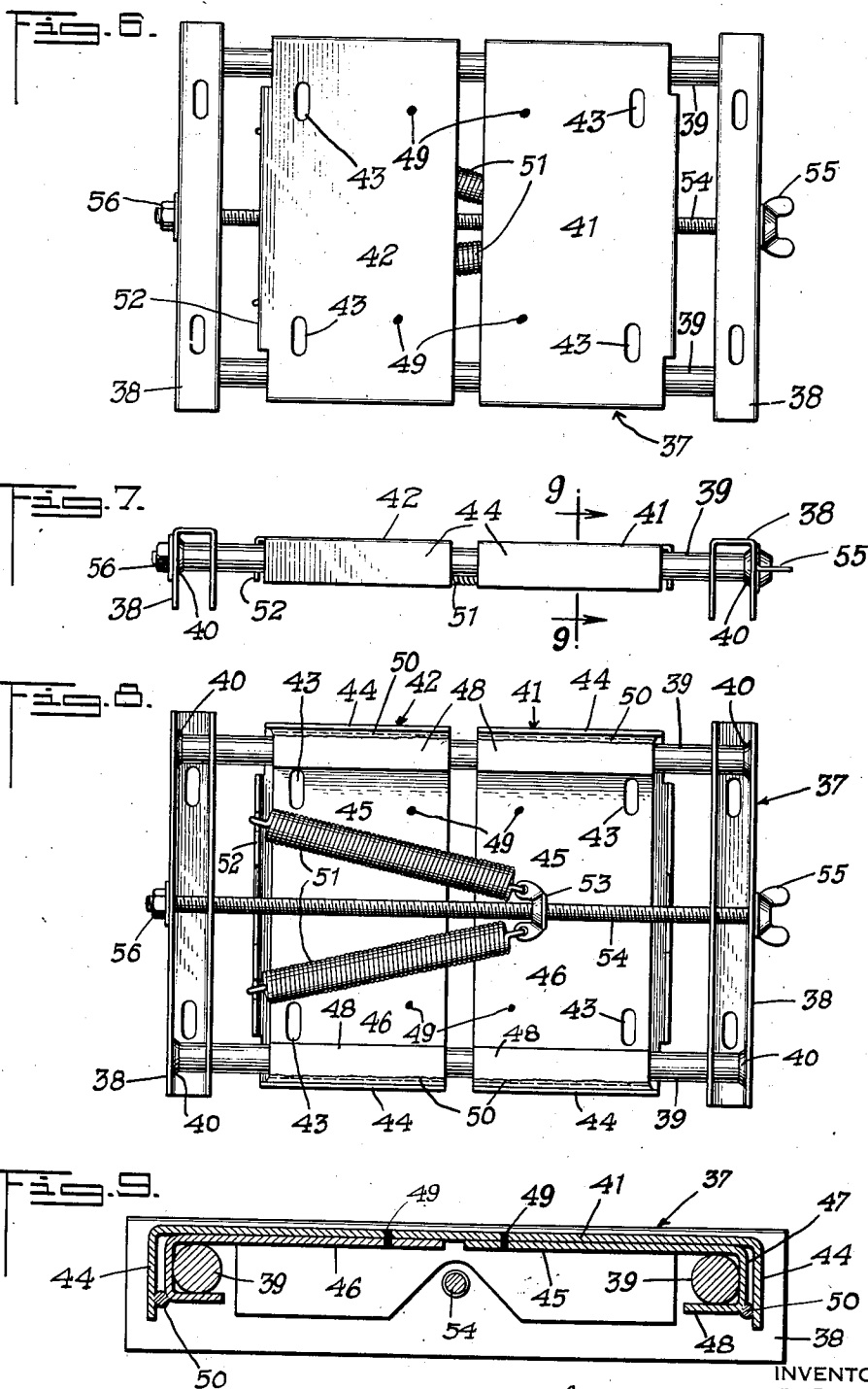
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,196,892

SUPPORT

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Application November 30, 1937, Serial No. 177,211

8 Claims. (Cl. 308—3)

This invention relates to supports and more particularly to supports for movably mounting a mechanism, such as a motor, to render said mechanism automatically adjustable with respect to another instrumentality, the present application being in part a continuation of my prior application S. N. 151,051, filed June 29, 1937.

For purpose of illustration, an electric motor has been chosen to represent the movably mounted mechanism and a pump to illustrate the relatively fixed instrumentality, and, merely for clarity of description, will be referred to specifically by those designations, but without restricting the invention thereto.

The objects of the invention are to provide an improved support for a motor or other mechanism in its relation to a relatively fixed pump or other instrumentality; to maintain precision of parallelism or alignment of the motor and pump; to overcome detrimental twisting, canting and torsional moments transmitted to said support; to render the support freely slidable; to minimize contact of the support with its rails; to reduce friction of such contact; to obtain rigidity of the support; to insure rigidity of the support next the rails; to enable the support to be spring tensioned with correct adjustment; to allow ready adjustment with the motor and pump in operation; to obtain accurate assembly; to enable the support to be used with various types of motors; to secure simplicity of construction and operation; and to obtain other advantages and results as may be brought out in the following description.

Referring to the accompanying drawings in which like numerals of reference indicate similar parts throughout the several views—

Figure 1 is an elevation, for convenience referred to as of the front, of a motor mounted on the support of the present invention, in operative association with a pump;

Figure 2 is an underneath view of the support; Figure 3 is a central longitudinal section of the support, and showing a part of the bed and motor associated therewith;

Figure 4 is a cross-section on line 4—4 of Fig. 3;

Figure 5 is an enlargement of the cross-sectional showing of Figure 4 of one rail and associated portion of the support;

Figure 6 is a plan of a support of preferred construction modified in some respect from the support of the preceding figures;

Figure 7 is a front edge view of the modified support of Figure 6;

Figure 8 is an underneath view of the modified support of Figures 6 and 7; and

Figure 9 is a cross-sectional view on line 9—9 of Figure 7, the scale being somewhat increased over the scale of Figure 7.

In the specific embodiment of the invention illustrated in said drawings, and referring initially to Figures 1 to 5 inclusive, the reference numeral 10 designates any suitable base on which is fixedly carried an instrumentality, such as pump 11, having a driver pulley 12 for a belt 13 extending to a driving pulley 14 on the armature shaft 15 of a motor 16 constituting the specific showing of instrumentality for which my improved support 17 is provided.

The support 17 provides a pair of parallel cleats 18 which are bolted or otherwise secured in fixed position upon the base 10 transverse to the length thereof or, in other words, parallel to the armature shaft of the motor. Between these cleats, and with their opposite ends secured in said cleats, are a pair of rails 19, 19. These rails are illustrated as parallel rods or bars which thus provide outside cylindrical bearing surfaces. Upon the pair of rails rests a carriage 20 which is preferably of sheet metal of sufficient gauge for the purpose. The marginal edges of this plate parallel to the rails are bent downward and somewhat inward, thus providing side flanges 21, 21 making acute included angles between each flange and the body or flat portion of the plate. Within this included angle is preferably secured a cushioning element 22, such as rubber, cork, or other material on the face of which remote from the metal of plate and flange, is an antifriction surfacing element 23 extended, by preference, substantially the length of the flange and plate and are sufficiently wide to enable the antifriction element to be fully supported by the cushioning element and to have a tangential line engagement on the top of the rail and at the side of the rail. Rivets 24 or other suitable means through the said elements and flange will hold the elements in place.

The proportion of parts is such that the flanges will slope to a position at least partially under the rails, and line engagement of the antifriction element on the flange will thus prevent the plate from lifting from the rail as well as preventing the plate from canting up at either end or from twisting laterally. The line contact of the flange and the line contact of the body of the plate with the rod (effected through the antifriction element) thus gives desired engagements throughout the length of flange and plate

body with the rail but with minimum engagement circumferentially of the rail. Very free sliding is thus secured. The antifriction element may be of appropriate material, such as one containing a lubricant of which graphite is an example, and with such means as asbestos and wire mesh for effecting body, strength and lasting characteristics. The element may therefore be relatively permanent and the support enabled to slide freely without need of extraneous oiling substantially as long as the machine is used. While I have shown a cushioning element 22 included between the metal of the plate and the antifriction element, for absorbing vibration and aiding to some extent in the free sliding by preventing wedging of the rail in the included angle, said cushioning element may be omitted entirely if desired and the antifriction element secured directly to the metal of the plate.

The tension of belt 13 tends to slide the motor toward the pump, and as the motor is secured, as by bolts 25, to the plate, the said plate will be normally drawn in the same direction. This sliding impetus is counteracted by a pair of springs 26, 26 beneath the plate. In this connection it is pointed out that said plate has stiffening flanges 27, 28 depending at its forward and rearward edges respectively, and said springs hook into appropriate holes in the forward flange 27, preferably quite near the ends of that flange. Said springs slope toward each other rearwardly and hook at their rear ends in the ends of a yoke 29. This yoke is shown of channel formation with the flanges of the channel projecting rearwardly and receiving non-rotatively a nut 30 in which is the threaded portion of a bolt or other adjusting means 31. Said adjusting bolt extends rearwardly and without screw engagement through the rear flange 28 of the plate (which is cut-out at 32 for that purpose) and through the rear one of the cleats, with its head beyond the cleat and a lock nut 33 interposed if desired between said head and cleat upon the threaded shank of the bolt. Said bolt head and lock nut are therefore exposed in position for ready access while the motor and pump are running, enabling proper tension to be applied to the springs under operating conditions. It may be observed at this time that, by the divergence of the springs to the forward end of the plate and convergence toward the adjusting screw head, a maximum stability is secured and minimum forces are introduced.

Referring to the showing of the preferred construction of support illustrated in Figures 6 to 9 inclusive, the same general instrumentalities are there present as in the preceding figures, the support being for use with a motor and for supporting such a motor in resilient slidable relation with respect to a driven element such as the compressor of Figure 1. Referring in detail to the specific embodiments in Figs. 6 to 9 inclusive, the reference numeral 37 designates in general a support providing, as before, a pair of parallel cleats 38 which are bolted or otherwise secured in use in fixed position upon any suitable base such as base 10 illustrated in Figure 1. The cleats in the instant showing are illustrated as of channel formation with the flanges of the channel directed downwardly, but the invention is not restricted to this particular type of cleat, the construction of which may be made identical with that of preceding figures if so desired. The construction is such that the cleats may be bolted in adjusted position with greatest facility upon

the base. Between these cleats extend a pair of parallel rails 39, 39 which being cylindrical, provide outside cylindrical bearing surfaces which can be conveniently inserted through holes of equal size thereto in the nearest flange of the cleats with the ends of the rails abutting the most posterior flanges to which they may be butt welded as indicated at 40. This assembly will secure a rigid construction and will maintain the rails with precision parallel to each other and properly spaced at all times.

Upon the pair of rails 39, 39 rests a carriage here shown as of longitudinal separable sections 41, 42. Each section is provided with a pair of slots 43 aligned transverse to the rails 39 and thus enabled to receive the four cornered bolts of a motor, such as shown in Fig. 1, for securing the motor and support sections firmly together. Inasmuch as the spacing of the bolt holes of various types of motors is not standard, the present construction enables sections 41 and 42 of the support to be spread more or less to align the bolt slots 43 of the supports with the bolt holes of the motor, the slots likewise accommodating variations in spacing of the bolt holes transversely of the support. After the motor is secured to the sections of the support, it will be obvious that said sections are rigid with respect to the motor and the motor and said support sections will accordingly move as a unit.

The lateral marginal edges of each section of the support are bent downwardly, thus providing side flanges 44 passing downwardly at the outside of rails 39, 39.

On the underside of each support section 41, 42, are pairs of bearing plates 45, 46 which extend in flatwise engagement against the undersurface of the upper plate of the section substantially from said flanges to the middle of the said section. These bearing plates 45, 46 have their lateral margins bent downwardly as at 47 and then inwardly as at 48 in channel formation of appropriate dimension to slidably engage against the rails 39. In other words, each bearing plate 45, 46 rests upon the top of its respective rail and has its lateral flange 47 bearing against the outside or lateral portion of said rail 39 and has its intumed flange 48 engaging at the underside of rail 39. The fabrication is made with appropriate accuracy to obtain sliding contact of the bearing plate with the rail without undue friction and without undue freedom so as to completely prevent any chattering between the bearing plate and rail. The several bearing plates are applied upon the rails so as to engage the downwardly directed flange of the plates with the sides of the rails, and then the upper supporting plate is applied thereafter and welded thereto or otherwise secured in fixed relation so as to insure positive contact of each bearing plate with three lines of contact with the rail. For convenience, the upper plate of the support may be spot welded, as at 49, to the under plate after the above described assembly has been effected. Additional security and rigidity is obtained by also welding, as at 50, flange 44 of the upper plate to the lower corner of flange 47 of the lower plate. It will be observed by this construction, that any variations in position of the rails 39, 39 with respect to each other is accommodated by the adjustable relationship of the under plates 45 and 46 during the assembly, and then each support is assembled with perfect sliding engagement between the rails and the respective bearing plates. The welding of the

flanges next the lower ends thereof, as at 50 obtains increased strength and maintains the said flanges in sliding relationship to the rails at all times. Consequently, line contact of the bearing plate is maintained by its surface on top, to bottom and side of each rail. The line contact, except for the gap which is made by spreading the plates to attach to the motor, is a continuous line of contact and will thus obtain a very smooth sliding engagement between the carriage and the rails, one which cannot introduce undesired binding of the carriage upon the rails, and yet one which will prevent chattering and other undesirable conditions.

The tension applied to sliding the motor to tighten the belt, is as in the previously described construction, obtained by a pair of springs 51, 51. These springs are attached as before to a stiffening flange 52 at the end of the support section 42 which in use is toward the compressor or other operated mechanism. The springs converge toward and are secured to a yoke 53 which in this instance takes the form of a wing-nut with the springs hooked into holes in the nut wings. The nut advances or retracts upon a screw 54 parallel to the rails, said screw having a bearing support in the flanges of cleats 38, 38. A head shown as in the form of wing head 55, added to the screw 54 enables the screw to be rotated and a nut or other means 56 at the opposite end of the screw beyond the cleat 38 retains the screw from longitudinal displacement either by tension of the springs or under the influence of its rotation. However, other means other than just described may be employed as a tensioning means for the springs. The construction lends itself to a simplicity of parts, ease of assembly and convenience of operation. The support of screw 54 at its opposite ends by the cleats and the divergence of the springs from yokes 53 to the forward end of the motor support obtains maximum stability and introduces minimum adverse forces.

Obviously other detail changes and modifications may be made in the construction and use of my improved support, and I do not wish it understood that I restrict myself to the details shown or described or the specific use and instrumentalities and mechanisms referred to except as set forth in the following claims when construed in the light of the prior art.

I claim:

1. A support comprising a pair of longitudinally parallel rails, a carriage slidable on said rails, said carriage having its slidable support on said rails by substantially a line contact with respect to each rail for substantially the length of said carriage, and said carriage having edge portions

thereof directed inwardly under the rails with another line contact for retaining the carriage seated on said rails.

2. A support comprising a pair of longitudinally parallel rails, a carriage slidable on said rails, said carriage having side flanges directed downwardly and obtaining slidable line contact with the rails at the sides thereof and directed inwardly beneath the rails obtaining slidable line contact with said rails beneath the same.

3. A support in accordance with claim 2 wherein the carriage comprises an upper plate extending entirely across both rails and a pair of end plates each of which provide the said flanges for slidably engaging respective rails and each being secured to the upper plate.

4. A support comprising a pair of longitudinal parallel rails, a support slidable on said rails, said support comprising sections separably transverse to the said rails, each section having its support on said rails by substantially a slidable line contact with respect to each rail for substantially the length of said section aligned to the rail.

5. A support in accordance with claim 4 wherein each section provides an upper plate and a pair of under plates secured together, said under plates each having flanges extending downwardly at the side of the respective rail and extending under each rail thereby giving to each under plate three parallel slidable line contacts with its respective rail.

6. A support comprising a pair of longitudinally parallel rails, a carriage on said rails, an anti-friction element disposed between said rails and carriage substantially the length of the carriage and providing substantially a line contact with respect to the rail.

7. A support comprising a pair of longitudinally parallel rails, a carriage on said rails having its side edges deflected inward under said rails, and an antifriction element interposed between each said rail and the overlying portion of the carriage and underlying flange for substantially the length of said carriage and flange for providing substantially line contacts supporting the carriage on the rail and retaining the carriage seated on the rail.

8. A support comprising a pair of longitudinally parallel rails, a carriage on said rails, an anti-friction element disposed between said rails and carriage substantially the length of the carriage and providing substantially a line contact with respect to the rail, and cushioning means between the carriage and said antifriction means.

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