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3,202,068 8/1965 Larsen..... 94/46
 3,377,933 4/1968 Dale 94/45

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[54] **QUICK CROWN CHANGE FOR SCREEDS AND THE LIKE**
 10 Claims, 4 Drawing Figs.

[52] U.S. Cl..... 94/45
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 [50] Field of Search..... 94/45, 46, 48

[56] **References Cited**
UNITED STATES PATENTS

2,150,618	3/1939	Blackwell	94/45
2,235,105	3/1941	Heltzel	94/45
2,299,700	10/1942	Millikin	94/45
2,351,593	6/1944	Barber	94/46
2,951,426	9/1960	Pollitz	94/45X
2,990,754	7/1961	Beeson	94/45
3,041,946	7/1962	Watters	94/46
3,080,798	3/1963	McCullough.....	94/45

ABSTRACT: Crown control for screeds and the like in which a continuous screed bar is suspended from a beam in the form of two aligned beam sections spaced apart at their adjacent ends. The beam sections are pivoted to the screed bar at their outer ends by brackets depending from the outer ends of the beam sections, and pivotally connected to the outer ends of the screed bar for movement about axes extending transversely of the bar. Spaced links are pivotally connected between each beam section and the screed bar and extend angularly downwardly and outwardly from the respective beam sections. A guiding connection is provided between the beam sections, and guides the beam sections for angular movement about their axes of connection to opposite ends of the screed bar. A power jack is spaced above the beam and extends across the adjacent ends of the beam sections, and is connected thereto at its opposite ends. As the jack is extended, the beam sections will pivot upwardly about their axes of connection to the screed bar. This will draw the screed bar upwardly from its opposite ends through the connecting links and will draw the screed bar into a parabolic crown. Retractable movement of the power jack will align the beam sections and move the screed bar into a flat position.

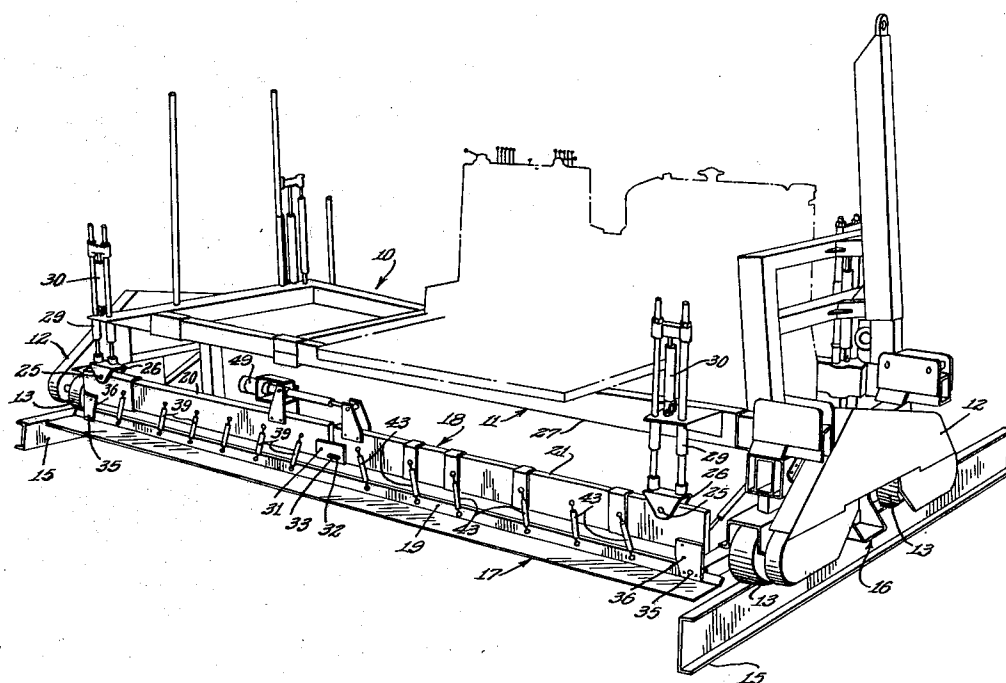
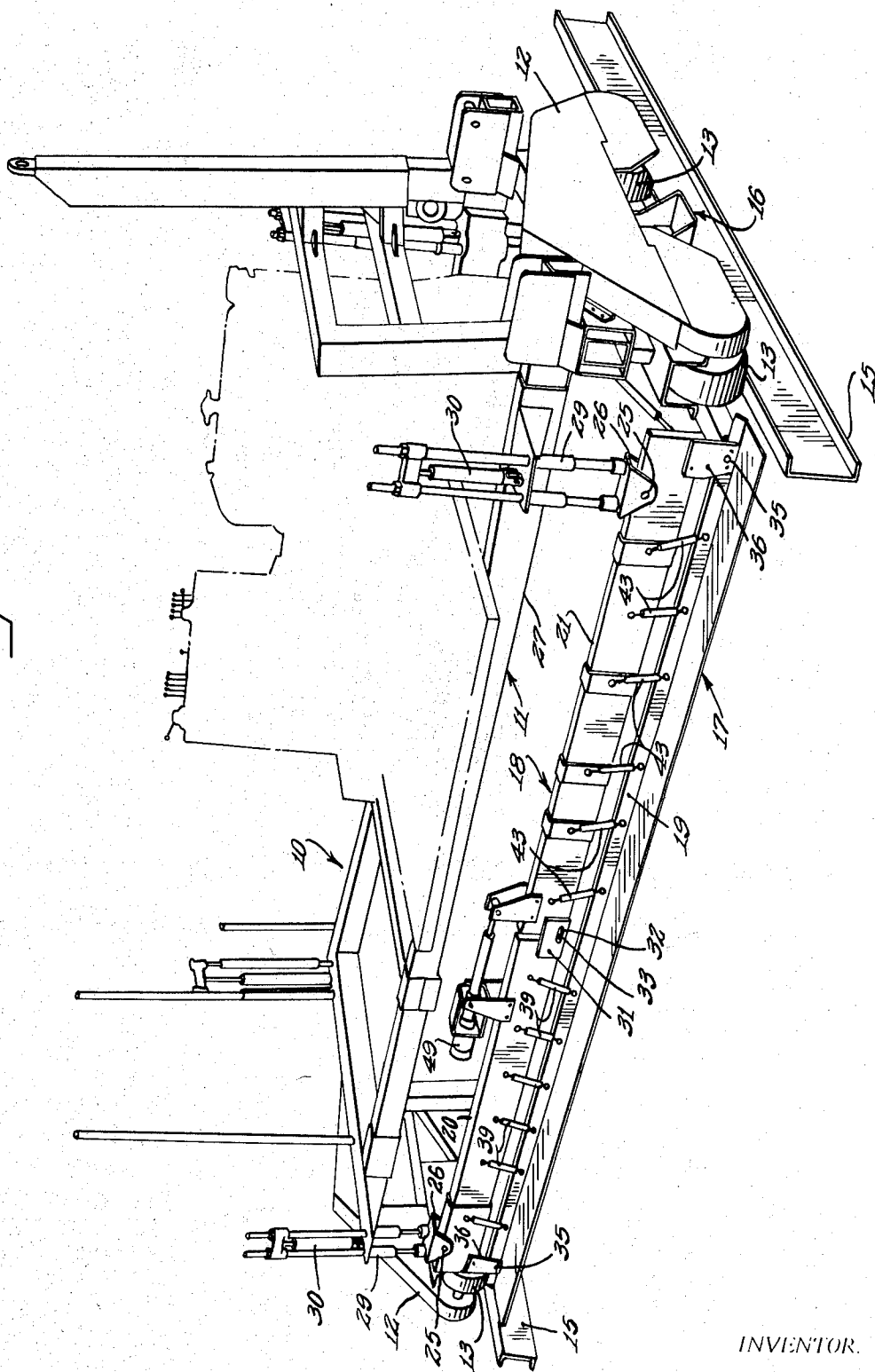


Fig. 1



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Fig. 2

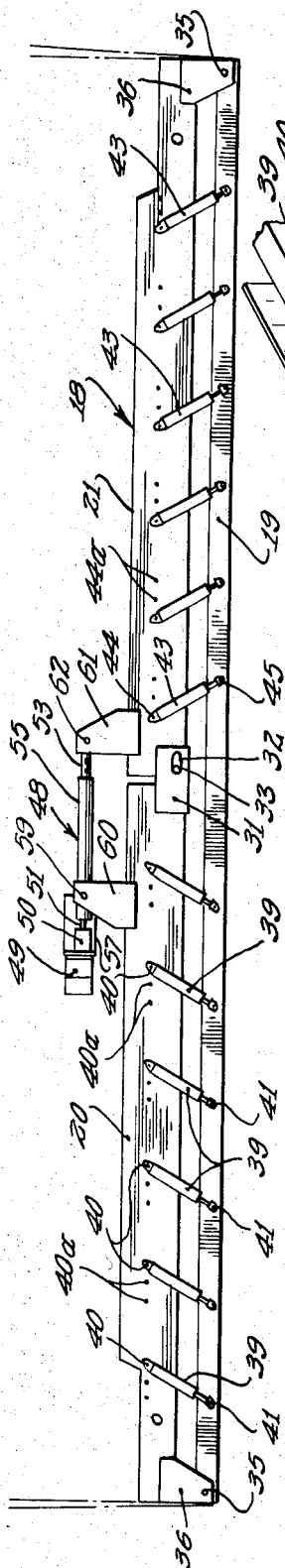


Fig. 4

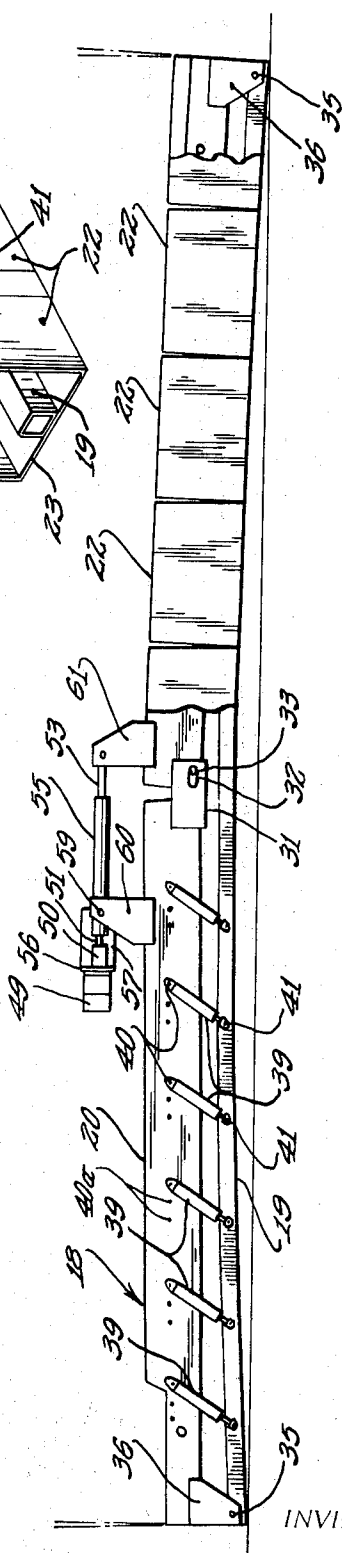


Fig. 3

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QUICK CROWN CHANGE FOR SCREEDS AND THE LIKE

SUMMARY AND OBJECTS OF THE INVENTION

A principal object of the present invention is to provide an improved form of screed arranged with a view toward crowning the screed in a simpler and more expeditious manner than formerly.

Another object of the invention is to provide a screed and support therefor in which the crown of the screed may readily be changed by power in a relatively short interval of time, and in which the high point of the crown may be varied to correspond to job specifications.

Still another object of the invention is to provide a spreader-finisher for concrete and the like, in which the screed for the spreader-finisher is suspended from a pair of aligned beam sections for pivotal movement about opposite ends of the screed, and in which a series of links connect the beam sections to the screed, to crown the screed as the beam sections are pivoted about their fixed axes of connection to opposite ends of the screed, and in which the crowning operation is by the extensible movement of power jack means connected to the adjacent ends of the beam sections.

Still another object of the invention is to provide a power operated quick crown change for screeds, trowel pans and the like, by changing the crown of the screed by the operation of hydraulic motor means, extensible to effect pivoting of suspension beam sections for the screed about opposite ends of the screed.

These and other objects of the invention will appear from time to time as the following specification proceeds and with reference to the accompanying drawings.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a spreader-finisher for concrete and the like, with certain parts of the apparatus shown diagrammatically and showing a screed bar and trowel pan constructed in accordance with the principles of the present invention at the trailing end of the apparatus.

FIG. 2 is a diagrammatic fragmentary view of the screed bar and crowning beam therefor, looking at the screed bar towards the rear end thereof and showing the screed bar in a level position.

FIG. 3 is a view somewhat similar to FIG. 2, but showing the screed bar in a crowned position, and showing screed pans on one-half of the screed bar.

FIG. 4 is a fragmentary detail perspective view illustrating a screed pan mounted on the screed bar and extending along the bottom and upwardly along the screed bar and the crowning beam section therefor, with certain parts broken away.

DESCRIPTION OF PREFERRED EMBODIMENT OF INVENTION

In the embodiment of the invention illustrated in the drawings, I have shown in FIG. 1, a generally diagrammatic perspective view of a spreader-finisher 10 for concrete and the like including a frame 11 extending across a roadway, along which a slab of concrete is to be laid, and mounted at its opposite ends on power traction units 12, 12, each of which is provided with a pair of traction wheels 13, 13. The traction wheels 13, 13 are mounted on and guided for movement along forms 15, 15, providing rails for said traction wheels in a manner similar to that shown and described in U.S. Pat. No. 3,202,068, dated Aug. 24, 1965, and no part of the present invention, so not herein shown or described in detail.

The spreader-finisher includes an oscillating screed 16 extending across the machine for the width thereof between the wheels of each set of wheels 13, 13 in a conventional manner. The apparatus also includes a trowel pan 17 extending across the trailing end of the machine and mounted on a deformable screed bar 19. The screed bar 19 is suspended from a transverse beam 18 shown as being in the form of a pair of aligned crowning beam sections 20 and 21, spaced from each other at

their adjacent ends a distance sufficient to accommodate vertical angular movement of said beams about their outer ends.

The screed 16 includes the conventional rectangular screed pans 22 mounted in end to end relation with respect to each other and having flat bottoms 23 mounted on the screed bar 19 as shown in FIG. 4 and having parallel upright sidewalls 24 extending vertically of said flat bottoms along said screed bar 19 and the beam sections 20 and 21 and spaced forwardly and rearwardly therefrom.

The screed pans 22 may be of a conventional form well-known to those skilled in the art and are supported and crowned in the same manner the trowel pan 17 is supported and crowned, so a description of the support and crowning means for the trowel pan 17, will suffice for a description of the support and crowning means for the screed pans 22.

The beam sections 20 and 21 are shown in FIG. 1 as being supported at their outer ends on pivot pins 25 extending through the spaced sides of brackets 26 suspended from a transverse support beam 27 of the frame 11, by adjustable suspension devices 29, 29. The fit between the pivot pins 25 and beam sections 20 and 21 may be sufficiently loose to accommodate angular movement of said beam sections about their outer ends to crown the screed bar 19, as will hereinafter more clearly appear as this specification proceeds. The suspension devices may be operated by hydraulic jacks 30, 30 to elevate and lower the beam sections 20 and 21 and the trowel pan 17 relative to the ground. The suspension devices 29 and hydraulic jacks 30 are no part of the present invention and may be of any conventional form, so need not herein be shown or described in detail.

The beam section 20 is shown as having a guide or retainer plate mounted on the inner rear end portion thereof and extending along the rear side thereof and along the rear side of the adjacent beam section 21, for a short portion of the length thereof. The retainer plate 31 has a slot 32 therein slidably engaged by a pin 33 extending outwardly of the beam section 21, to accommodate pivotal movement of the two beam sections 20 and 21 about the axes of pivot pins 35 at opposite ends of the screed bar 19 and extending transversely thereof. A similar retainer plate (not shown) may be mounted on the opposite sides of the beam sections 20 and 21.

As shown in FIGS. 1, 2 and 3, the beam section 21 has a hanger bracket 36 secured to the rear face thereof and extending downwardly along the outer end portion of the screed bar 19 and pivotally connected thereto on the pivot pin 35. The beam section 20 likewise has a hanger bracket 36 secured to its rear face adjacent the outer end portion thereof, and depending therefrom along the rear face of the screed bar 19 and pivotally connected to said screed bar on a pivot pin 35. The hanger brackets 36, 36 mounted on the pivot pins 35, 35 at opposite ends of the screed bar 19, and rigidly secured to the outer end portions of the beam sections 20 and 21, thus form pivotal mountings for the opposite ends of said beam sections accommodating pivotal movement of said beam sections about the axes of the pivot pins 35, 35, under the control of the retainer plate 31, slot 32 and pivot pin 33.

A plurality of links 39, shown as being in the form of turn-buckles, are pivotally connected to the rear face of the beam section 20 as by pivot pins 40 and are pivotally connected to the rear face of the screed bar 19 as by pivot pins 41. The links 39 are shown as inclined outwardly and downwardly of the pivot pins 40 and are positioned in generally parallel relation with respect to each other when the screed bar 19 is level. In a like manner a plurality of inclined links 43 are pivotally connected between the beam section 21 and the screed bar 19 on pivot pins 44 and 45 respectively. The connector links 43, 43 are inclined in opposite directions from the connector links 39, 39 and extend in generally parallel relation with respect to each other when the screed bar 19 is level.

A power jack means 48 is provided to raise the adjacent ends of the beam sections 20 and 21 about the axes of the pivot pins 35, 35 and draw the central portion of the screed bar 19 upwardly with the beam sections through the links 39

and 43 and to thereby place a crown on the screed bar 19 and the trowel pan 17 or screed pans 22 extending therealong. As diagrammatically shown in the drawings the power jack means 48 is in the form of a screw and nut type of jack, but may be a hydraulic jack or any other form of extensible jack. A fluid pressure motor 49 is shown as having driving connection with a coupling sleeve 50, which in turn rotatably drives a shaft 51 which may be threaded (not shown) in a hollow shaft 53 guided in an elongated sleeve 55. The motor 49 is mounted on an end wall 56 of a motor bracket 57, trunnioned on trunnion pins 59, which also form a trunnion support for the sleeve 55. The trunnion pins 59 extend from opposite sides of the sleeve 55 and are trunnioned between a pair of bracket plates 60, extending upwardly of the beam section 20. The hollow shaft 53 is trunnioned between trunnion plates 61 on trunnion pins 62. The trunnion plates 61 are like the trunnion plates 60 and extend vertically of opposite sides of the beam section 21. Operation of the motor 49 will thus tend to pivot the aligned beam sections 20 and 21 about the axes of the pivotal pins 35 and therefore raise the adjacent inner ends of the beam sections 20 and 21. The pivot pins 35, 35 pivoted to opposite ends of the screed bar 19 are thus held from spreading by said screed bar while the beam sections 20 and 21 rise at the high part of the crown. The links 39 and 43, shown as being in the form of turnbuckles, will thus hold the screed bar 19 into an arc or crown and may be adjusted to effect uniform crowning of the screed bar 19.

It may be seen from FIGS. 2 and 3 that the high point of the crown always occurs at the adjacent ends of the beam sections 20 and 21, and one or the other beam section may be lengthened while the other beam section may be shortened to vary the location of high point of the crown, to correspond to job specifications.

Holes 40" and 44" for the respective pivot pins 40 and 44 may also be provided in the respective beams 20 and 21 to enable the angles of the respective turnbuckles 39 and 43 to be varied to vary the crown of the screed bar 19 where required. It should also be understood that tightening or loosening of the turnbuckles may also vary the crown of the screed bar 19, and may effect fine adjustment of the crown.

The crown may be removed by reversing the direction of rotation of the hydraulic motor 49 lowering the adjacent inner ends of the beam sections 20 and 21 until the screed bar 19 is level, at which time the screed pans or trowel pan will also be level to finish a level roadway.

While I have herein shown and described one form in which the present invention may be embodied, it may readily be understood that various modifications and variations in the invention may be attained without departing from the spirit and scope of the novel concepts thereof.

I claim:

1. In a screed and in combination with a spreader-finisher for paving materials including:
 - a mobile frame;
 - a beam extending across said frame;
 - means suspending said beam from said frame adjacent opposite ends thereof;
 - said beam being in the form of two separate aligned beam sections;
 - means guiding said beam sections along their inner ends for relative angular movement with respect to each other in vertical directions;
 - a continuous screed bar disposed beneath said beam sections and extending generally parallel thereto for the length thereof;
 - finishing means extending along said screed bar;
 - means suspending said screed bar from said beam sections, adjacent the outer ends of said beam sections and forming a reaction means for the outer end portions of said beam sections;
 - connecting means connected between said beam sections and screed bar at spaced intervals therealong;

extensible means connected between said beam sections adjacent the inner ends thereof, for moving said beam sections upwardly about the reaction means of said beam sections to said screed bar, and effecting the crowning of said screed bar by the compressive action of said beam sections on said screed bar and the drawing action of said connecting means on said screed bar; and

said means guiding said beam sections for relative angular movement with respect to each other in vertical directions comprising a guide member connected to one end of one beam section and extending along the next adjacent beam section, and a lost motion connection between said guide member and the next adjacent beam section.

2. A screed in accordance with claim 1:

wherein the connecting means connected between said beam sections and said screed bar at the spaced intervals therealong, comprise links pivotally connected between said beam sections and screed bar, in which the links connected between a first of said beam sections and said screed bar diverge angularly toward the outer end of said screed bar as they extend downwardly from said beam section and are positioned substantially parallel with each other when the screed bar is level; and

wherein the links connected to a second of the beam sections diverge angularly toward the outer end of the screed bar in opposite angular relation with respect to the links connected to the first beam section.

3. The screed in accordance with claim 2, wherein the links are in the form of turnbuckles.

4. A screed in accordance with claim 2, wherein the extensible means comprises a power operated jack extending across the adjacent ends of said beam sections and pivotally connected between said beam sections.

5. A screed in accordance with claim 2:

wherein the extensible means is in the form of a power operated jack;

wherein a motor is provided to operate said jack;

wherein support brackets extend upwardly of said beam sections adjacent the adjacent ends thereof; and

wherein said power operated jack is trunnioned to said support brackets to spread the beam sections upon extensible movement of said jack against the reaction afforded by the pivotal connections of said beam sections to said screed, to pull the screed bar into an arc or crown having a high point at the adjacent ends of said beam sections.

6. A screed in accordance with claim 1:

wherein the reaction means comprise pivot pins pivotally connecting the outer ends of said beam sections to said screed bar; and

wherein the connecting means comprise generally parallel links depending from each beam section and inclined outwardly relative to said beam sections as they extend downwardly and are connected with said screed bar.

7. A screed in accordance with claim 1:

wherein the means suspending said screed bar from said beam sections comprise bracket members depending from the outer ends of said beam sections;

wherein the reaction means comprise pivot pins pivotally connecting said bracket members to said screed bar, adjacent the outer ends thereof, for movement about axes extending transversely of said screed bar; and

wherein the connecting means comprise turnbuckles pivotally connected between said beam sections and said screed bar and inclined outwardly relative to said beam sections as they extend downwardly and are pivotally connected to said screed bar.

8. A screed in accordance with claim 7:

wherein the power means comprises a fluid pressure operated jack;

wherein support brackets extend upwardly of said beam sections adjacent the adjacent ends thereof; and

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wherein said fluid pressure operated jack includes one member trunnioned to said support brackets extending upwardly of one beam section and an extensible member trunnioned to said support brackets extending upwardly of said other beam section; to elevate the adjacent ends of said beam sections against the reaction afforded by the pivot pins connecting said bracket members to said screed bar, to exert a buckling compressive force on said screed bar cooperating with said turnbuckles, to pull said screed bar into a crown having a high point at the ad-

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jacent ends of said beam sections.

9. A screed in accordance with claim 8, wherein the finishing means comprises a trowel pan mounted on the bottom of said screed bar.

10. A screed in accordance with claim 8, wherein the finishing means comprises a plurality of abutting screed pans extending along the bottom of said screed bar and upwardly along opposite sides thereof.

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