

March 14, 1939.

S. R. BLACKWELL

2,150,618

SCREED

Filed Aug. 5, 1936

3 Sheets-Sheet 1

Fig. 1

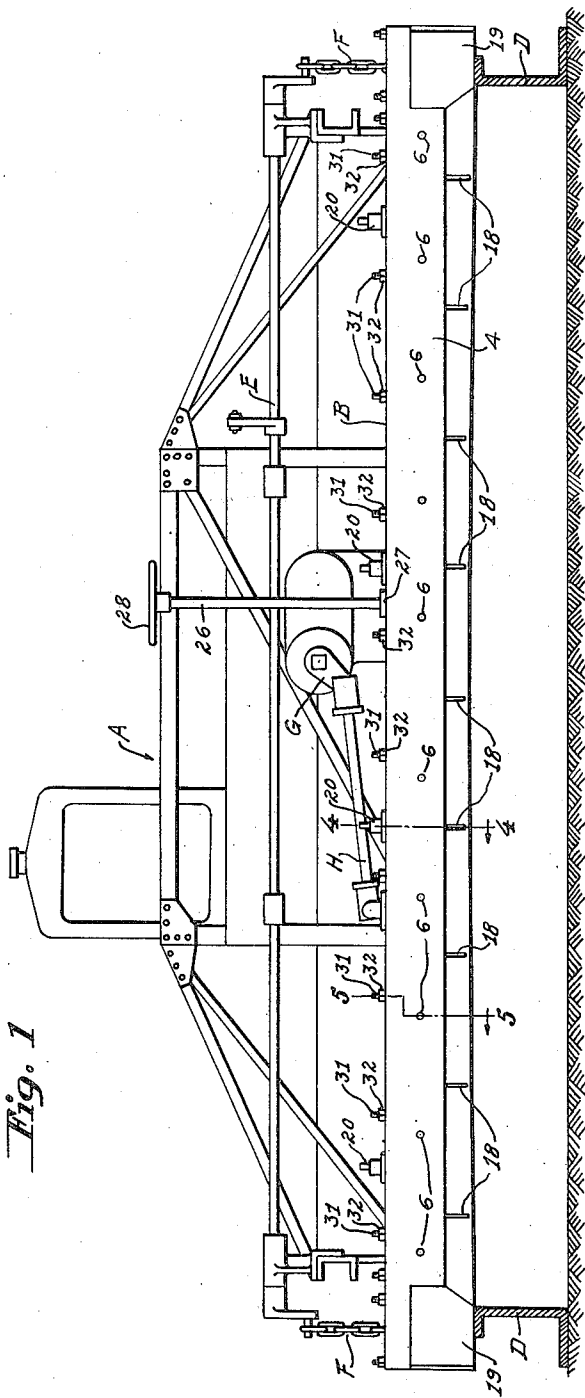
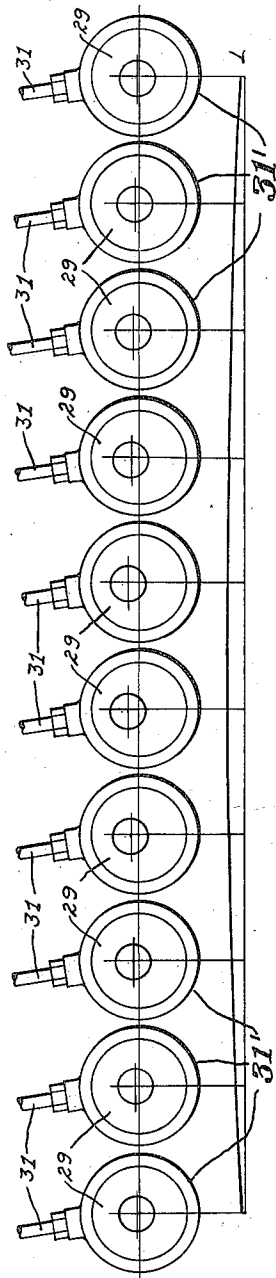


Fig. 9



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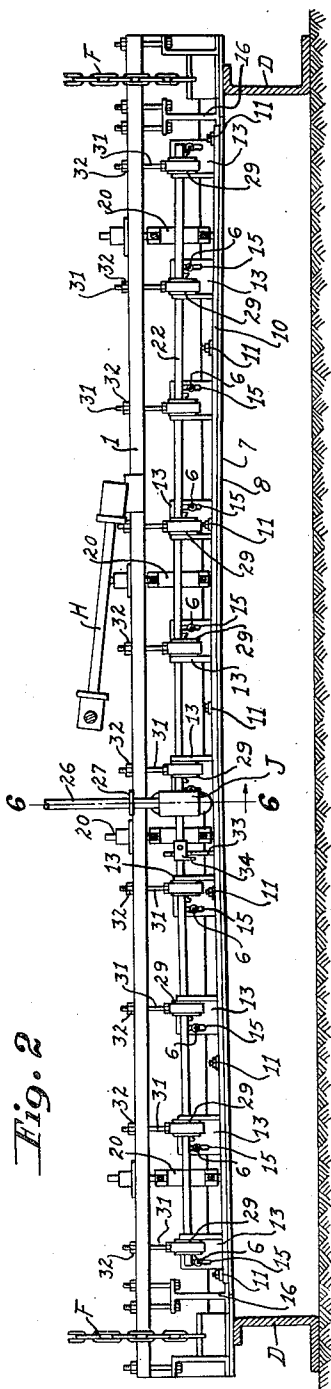


Fig. 8

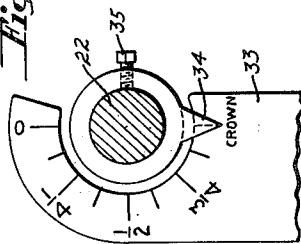


Fig. 7

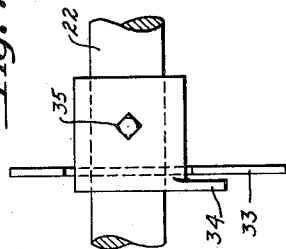
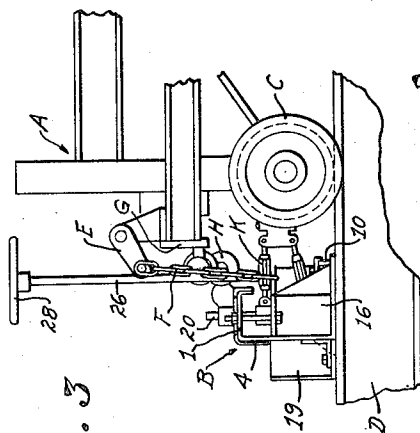
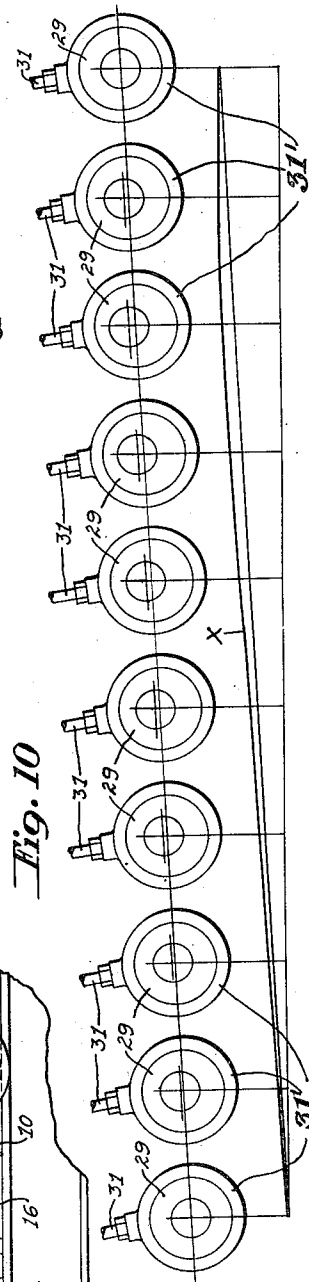


Fig. 10



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Fig. 4

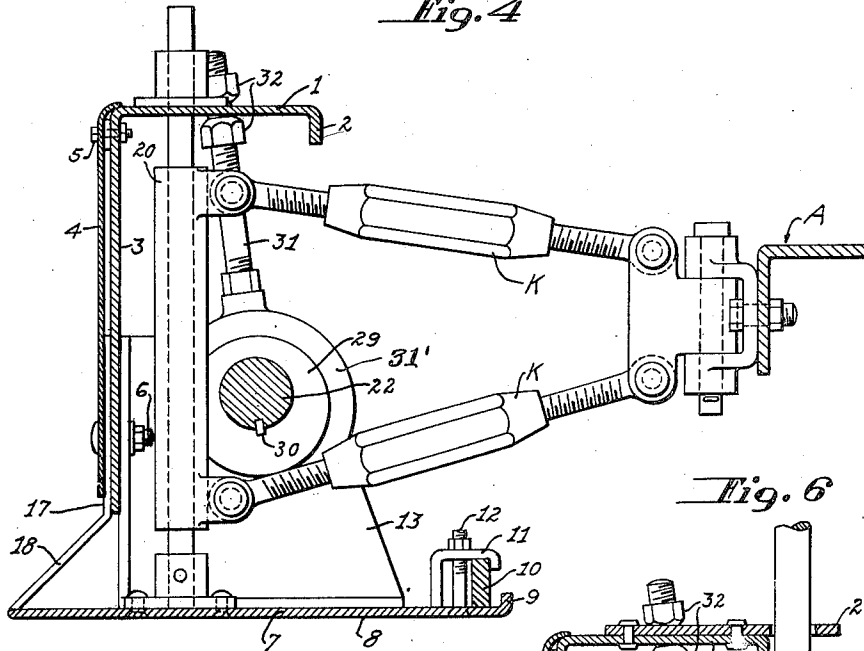


Fig. 6

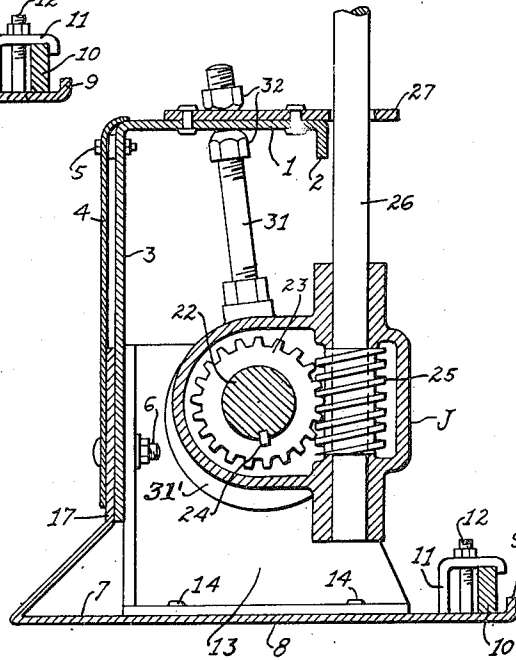
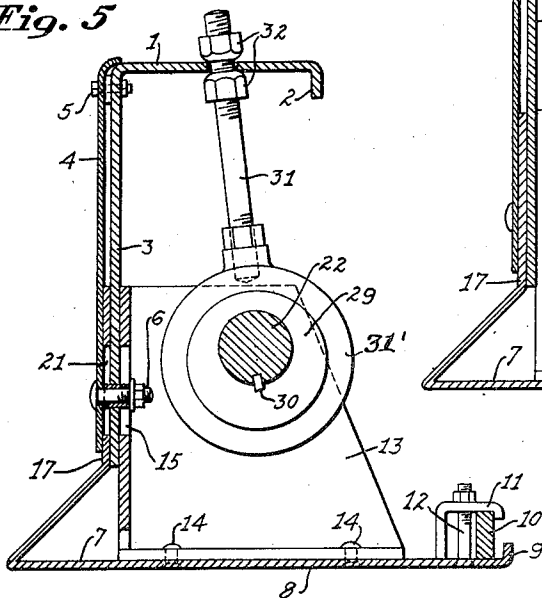


Fig. 5



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Application August 5, 1936, Serial No. 94,365

7 Claims. (Cl. 94-45)

This invention relates to a new and useful improvement in screeds, and has for its object to provide a vertically adjustable screed of relatively simple but durable and efficient construction.

In concrete road construction a typical road is twenty feet wide, and on a straight stretch of road a one-inch crown in the center of said road is usually provided. This crown tapers from its maximum at the center to nothing at the sides abutting the shoulders. On a curve there is usually only a tangent running from the outside of the curve to the inside of said curve. It is extremely important in road construction work to conserve labor expense, and in my device the labor of regulating the elevation of or adjusting the pitch of the bottom shoe of the screed is reduced to a minimum of time, being such only as is required in turning a handwheel, which in turn rotates a shaft which controls a series of eccentrics which determine at points across the screed the height of the bottom shoe of said screed from the straight base line across the roadway from one side form to the other.

In the only adjustable screeds of which I am aware it takes more than one hour to adjust the bottom shoe of the screed, and as this is expensive labor involved in this work and in the loss of time of other allied employees, it is highly important that the time required for such adjustment should be reduced to a minimum.

Fig. 1 is a front elevation of my improved screed and a part of the supporting structure thereof, with the two side forms of the road in section.

Fig. 2 is a rear elevation of my improved screed with the two side forms of the road in section.

Fig. 3 is an end view of my improved screed with one road side form partly broken away and parts of the screed-supporting structure partly broken away.

Fig. 4 is a view taken on the line 4-4, Fig. 1, looking in the direction of the arrows.

Fig. 5 is a view taken on the line 5-5, Fig. 1, looking in the direction of the arrows.

Fig. 6 is a view taken on the line 6-6, Fig. 2, looking in the direction of the arrows.

Fig. 7 is a side elevation of the dial and pointer shown in Fig. 8.

Fig. 8 is a front elevation of the dial and pointer, with the shaft on which said pointer is mounted being in section.

Fig. 9 is a diagrammatical view of the settings of the eccentrics for forming a one-inch center crown diminishing to nothing at the sides of the road of a twenty foot roadway.

Fig. 10 is also a diagrammatical view of the settings of the eccentrics for forming a one-inch crown at the center twenty foot section of a forty foot road, where the crown merges into a tangent which proceeds from the side ten feet on each side of the road.

In the drawings, A generally designates a supporting structure for the screed B, said supporting structure being motor driven and mounted on flanged traction wheels C which ride on the road side forms D. The screed B as a whole may be raised or lowered by the mechanism E attached to the chains F at the sides of the screed. The mechanism E is under the control of the operator of the structure.

A transverse reciprocatory movement is imparted to the screed B as it advances over the work by the crank G attached by the rod H to the beam of the screed B. The crank G is operated by a gasoline motor (not shown) on the supporting structure A. Such reciprocatory movement is in the arc of a circle so that the circular crown of the road is not disturbed by such movement, which is usually only a few inches.

The screed B has a beam 1 at its upper portion which is formed from a sheet of metal and is provided with a short, downwardly depending, stiffening flange 2 at its rear edge and a longer, downwardly depending flange or apron 3 at its forward edge. To the flange or apron 3 is secured a protector plate 4 by a series of bolts 5 and 6 at the upper and lower portions, respectively, of the flange 3. The purpose of this protector plate is to prevent the entrance of the cement and allied materials into the working parts controlling the screed B.

To the lower portion of the flange 3 is secured a relatively flexible bottom shoe 7 which has a substantially flat bottom face 8. The inner end of the bottom shoe 7 is upturned as at 9 to form a stiffening member. Adjacent the upturned end 9 is a stiffening bar 10 extending across the bottom shoe 7 from side to side.

The bar 10 is held in place by clamps 11 secured by the bolts 12 passing through the rear end of the bottom shoe 7. The stiffening member 9 and bar 10 are placed at the rear end of the bottom shoe 7 to equalize the movement of both the front and rear portions of said shoe when pressure to vertically position said shoe is applied. The length of these stiffening members being twenty feet and they being relatively thin in cross section, they do not retard the vertical adjustment of said shoe by the eccentrics 29. At spaced intervals across the upper portion of

the bottom shoe 7 brackets are attached to said bottom shoe, preferably by rivets 14 (see Figs. 5 and 6). These brackets 13 are also secured to the flange 3 by the bolts 6 which pass through slots 15 in the forward portion of the said brackets 13 (see Fig. 5), to permit of vertical movement of said brackets with respect to said flange. At each end of the screed B are hangers 16 extending from the beam 1 to the bottom shoe 7.

The upwardly extending portion 17 of the bottom shoe 7 is provided with a series of notches 18 extending downwardly from the top of the portion 17 to where the bottom shoe 7 projects rearwardly from the portion 17. The purpose of these notches is to render the bottom shoe 7 flexible so that it may be readily adjustable by the means hereinafter to be described.

At each side of the screed B are end shoe baffle plates 19. The bottom shoe 7 is also supported by a series of hangers 20 (see Figs. 2 and 4). The upwardly extending portion 17 is slotted as at 21 to receive the bolt 6. By virtue of said slots the bottom shoe 7 is permitted vertical movement with respect to the flange 3.

A shaft 22 extends from one side of the screed B to the other and is mounted in each of the brackets 13 in a bearing fit. The shaft 22 is rotatable a one-half revolution by the worm wheel 23, keyed to said shaft as at 24, said worm wheel being operable by the worm 25 mounted on the shaft 26 passing through the supporting and bearing plate 27 riveted to the beam 1 of the screed B. The shaft 26 is manipulated by the handwheel 28 located adjacent the operator of the device. The worm wheel 23 and the worm 25 are encased in the housing J.

On the shaft 22 are a series of eccentrics 29 held to said shaft by the keys 30. In Fig. 2 the brackets 13 on the bottom shoe 7 are usually spaced about 2 ft. apart. The shaft 22 has a bearing fit in each of the brackets 13 so as to cause said brackets to raise or lower as the shaft 22 is turned. Where the shaft rotates only fractionally at periodical times, the curvature thrown into the shaft by the operation of the cam 29 in the ring 31' carried by the lower end of the rod 31 is not objectionable, as it throws no particular strain on said shaft, as it would if said shaft were constantly rotated. The shaft is only deflected from a straight line commencing near the outer sides of the screed to a maximum not exceeding 2 inches, the standard crown being approximately 1 inch, so that the shaft 22 is never deflected substantially, and as only a slight amount of rotation is imparted to said shaft in order to provide for a different curvature of the surface of the concrete road, such slight deviation from a straight line has no effect whatever on the life of the shaft. The bottom shoe 7 may not have to be adjusted for a period of several days if the grade or angle of the road surface remains the same.

The rods 31 are adjustable with respect to the beam 1 by the nuts 32, for the reason that should the beam be dented or bent or sag, the rods 31 can be adjusted through the nuts 32 to equalize the distance between the shaft 22 and the beam 1 by virtue of adjusting the rods 31. It will be noted that the ends of the nuts 32 on the rods 31 which contact the upper and lower faces of the beam 1 are beveled to permit of the slight swinging movement of the rods 31 as the eccentric in the ring carried by the lower end of the rod 31 is turned. The eccentrics or cams 29 co-operate with the shaft 22 to raise or lower the brackets 13 and thus deflect the bottom

shoe 7. These eccentrics are supported on the beam 1 by the rods 31 through the rings 31' and are primarily adjusted by the nuts 32 above and below the beam 1. The nuts 32 are beveled at their contact with the beam 1 to permit the rods 31 to swing as the shaft 22 is rotated by the worm 25. A dial 33 is mounted on the screed B at a point where it may be seen by the operator of the device. A pointer 34 is fixed on the shaft 22 by the set screw 35 and indicates on the dial 33 the position of the bottom shoe 7 when adjusted by the eccentrics 29.

A further support K for the screed B is shown in Fig. 4. As this support constitutes no part of my invention, it is believed the illustration in Fig. 4 is sufficiently descriptive of said support.

In the diagrammatical drawing shown in Fig. 9 provision is shown for putting a one-inch crown in a twenty foot wide road. Starting at zero at the sides L, the surface of the road gradually rises on the arc of a circle to a one-inch crown in the center of the road. When approaching a curve the crown is gradually eliminated and a tangent substituted. By manipulating the handwheel 28 and watching the dial 33, the operator immediately adjusts the eccentrics 29 to cause the bottom shoe 7 to merge from the arc of a circle to a tangent of the degree specified by the highway department for the road being constructed.

After leaving the curve the screed must again be adjusted to insert the circular crown in the surface of the road, and such adjustment is again made by the operator by manipulating the handwheel 28.

In the diagrammatical drawing of Fig. 10 I have shown a twenty foot section of a forty foot wide road, in which the circular crown portion is shown in the right-hand side of said drawing and the tangent portion is shown in the left-hand side of said drawing. The tangent portion merges into the circular crown portion at the part marked X on said drawings. It will be understood that when the tangent and circular crown portions are set forth in the highway department's plans the eccentrics 29 of the screed B are arranged and set accordingly, so that when the shaft 22 is rotated the eccentrics 29, acting through said shaft 22 and brackets 13 attached to the flexible bottom shoe 7, adjust said shoe the required distance up or down to take care of the circular crown portion and the tangent portion as called for by said plans. As said before, such adjustment is quickly and easily made without the loss of any time and the roadwork progresses uninterruptedly. The eccentrics are set in accordance with the plans specified by the highway department, and the eccentrics are changed to conform to the set up of the road being constructed.

I claim:

1. A screed comprising a beam, a flexible bottom shoe suspended from said beam, a plurality of upwardly extending brackets rigidly fixed at spaced points along the length of said flexible bottom shoe, a plurality of rods secured to said beam and extending downwardly therefrom, said brackets being suspended from said beam through said rods, a single, continuous operating member extending substantially the length of said bottom shoe and rotatably connected with said brackets and said rods, and eccentric means co-operating with said continuous operating member whereby said flexible bottom shoe may be flexed when said operating member is turned.

2. A screed comprising a beam, a flexible bot-

tom shoe suspended from said beam, a plurality of upwardly extending brackets rigidly fixed at spaced points along the length of said flexible bottom shoe, a plurality of rods secured to said beam and extending downwardly therefrom, said brackets being suspended from said beam through said rods, a single, continuous operating member extending substantially the length of said bottom shoe and rotatably connected with said brackets and said rods, and eccentric means co-operating with said continuous operating member whereby adjacent portions of said flexible bottom shoe may be displaced, not all to the same extent, when said operating member is turned.

3. A screed comprising a beam, a flexible bottom shoe suspended from said beam, a plurality of upwardly extending brackets rigidly fixed at spaced points along the length of said flexible bottom shoe, a plurality of rods secured to said beam and extending downwardly therefrom, said brackets being suspended from said beam through said rods, a single, continuous operating member extending substantially the length of said bottom shoe and rotatably connected with said brackets and said rods, and eccentric means co-operating with said continuous operating member whereby said brackets are simultaneously operated to displace the corresponding portions of said flexible bottom shoe at the points to which said brackets are fixed.

4. A screed comprising a beam, a flexible bottom shoe suspended from said beam, a plurality of upwardly extending brackets rigidly fixed at spaced points along the length of said flexible bottom shoe, a plurality of rods secured to said beam and extending downwardly therefrom, said brackets being suspended from said beam through said rods, a single, continuous operating member extending substantially the length of said bottom shoe and rotatably connected with said brackets and said rods, and eccentric means co-operating with said continuous operating member, said means being of such character as to flex the flexible bottom shoe to a different extent along the length of said bottom shoe, and means for turning said continuous operating member for operating said brackets.

5. A screed comprising a beam, a flexible bottom shoe supported from said beam, means for flexing said flexible bottom shoe to a desired curvature, said means comprising a plurality of upwardly extending brackets provided with trans-

verse bearing fit openings rigidly fixed at spaced points along the length of said flexible bottom shoe, a plurality of apertured rods suspended from said beam downwardly to a point below the top of said brackets so that the apertures in said rods and the transverse openings in said brackets are in substantial alinement, a single, continuous, rotatable operating member passing through the openings in said brackets and the apertures in said rods, and eccentric means co-operating with said operating member whereby said flexible bottom shoe may be adjusted when said operating member is turned.

6. A screed comprising a beam, a flexible bottom shoe supported from said beam, means for flexing said flexible bottom shoe to a desired curvature, said means comprising a plurality of upwardly extending brackets provided with transverse bearings fit openings rigidly fixed at spaced points along the length of said flexible bottom shoe, a plurality of apertured rods suspended from said beam downwardly to a point below the top of said brackets so that the apertures in said rods and the transverse openings in said brackets are in substantial alinement, a single, continuous, rotatable operating member passing through the openings in said brackets and the apertures in said rods, eccentric means co-operating with said operating member whereby said flexible bottom shoe may be adjusted when said operating member is turned, and means for separately adjusting each of said rods with respect to said beam.

7. A screed comprising a beam, a flexible bottom shoe suspended from said beam, means for flexing said flexible bottom shoe to a desired curvature, said means comprising a plurality of upwardly extending brackets rigidly fixed at spaced points along the length of said flexible bottom shoe, a plurality of rods suspended from said beam and extending downwardly therefrom to a point adjacent the top of said brackets, a single, continuous operating member rotatably associated with said brackets and said rods, eccentric means co-operating with said operating member and said rods for simultaneously operating said brackets to displace the corresponding portions of said flexible bottom shoe, said rods being movably mounted transversely in the beam, and nuts mounted on the ends of said rods passing through the beam and contacting the upper and lower faces of said beam for separately adjusting each of said rods.

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