

March 26, 1935.

A. W. FRENCH

1,995,450

ADJUSTABLE SCREED

Filed Aug. 19, 1933

2 Sheets-Sheet 1

Fig. 1.

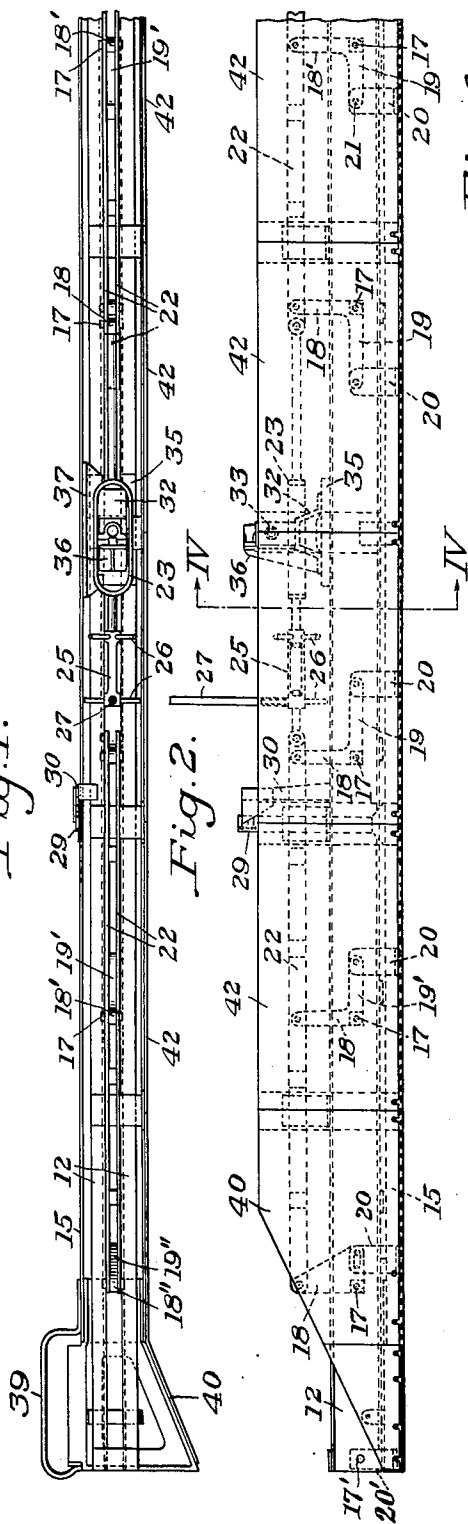


Fig. 2.

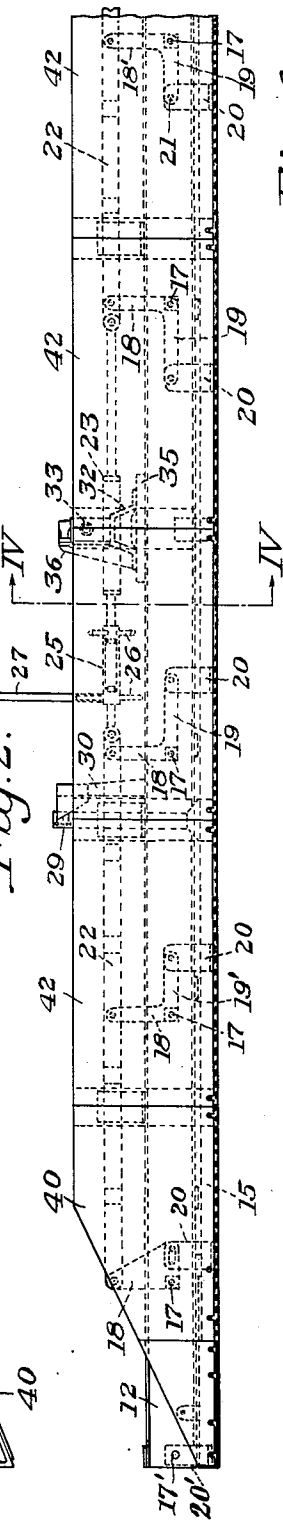


Fig. 4.

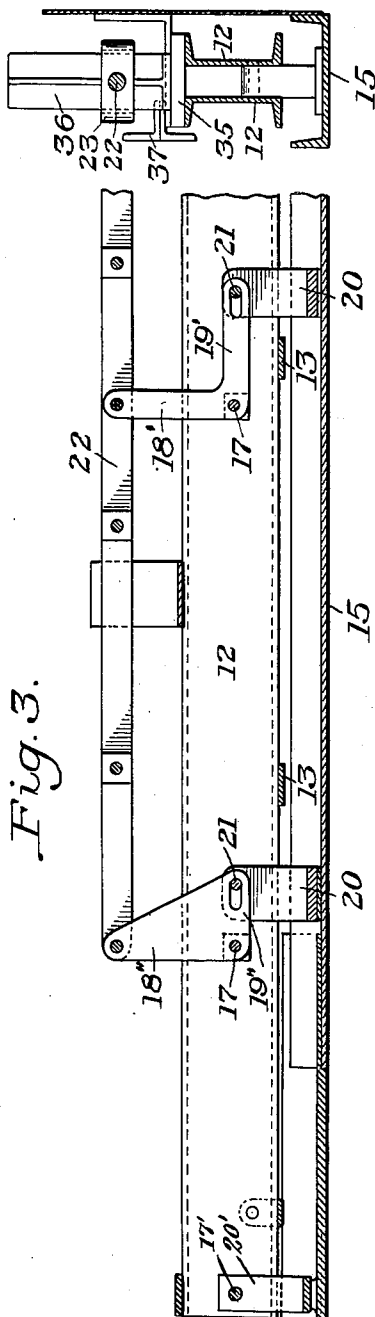
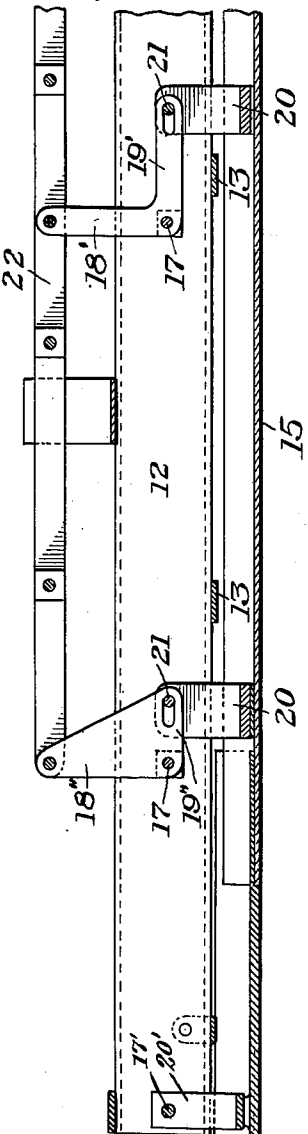


Fig. 3.



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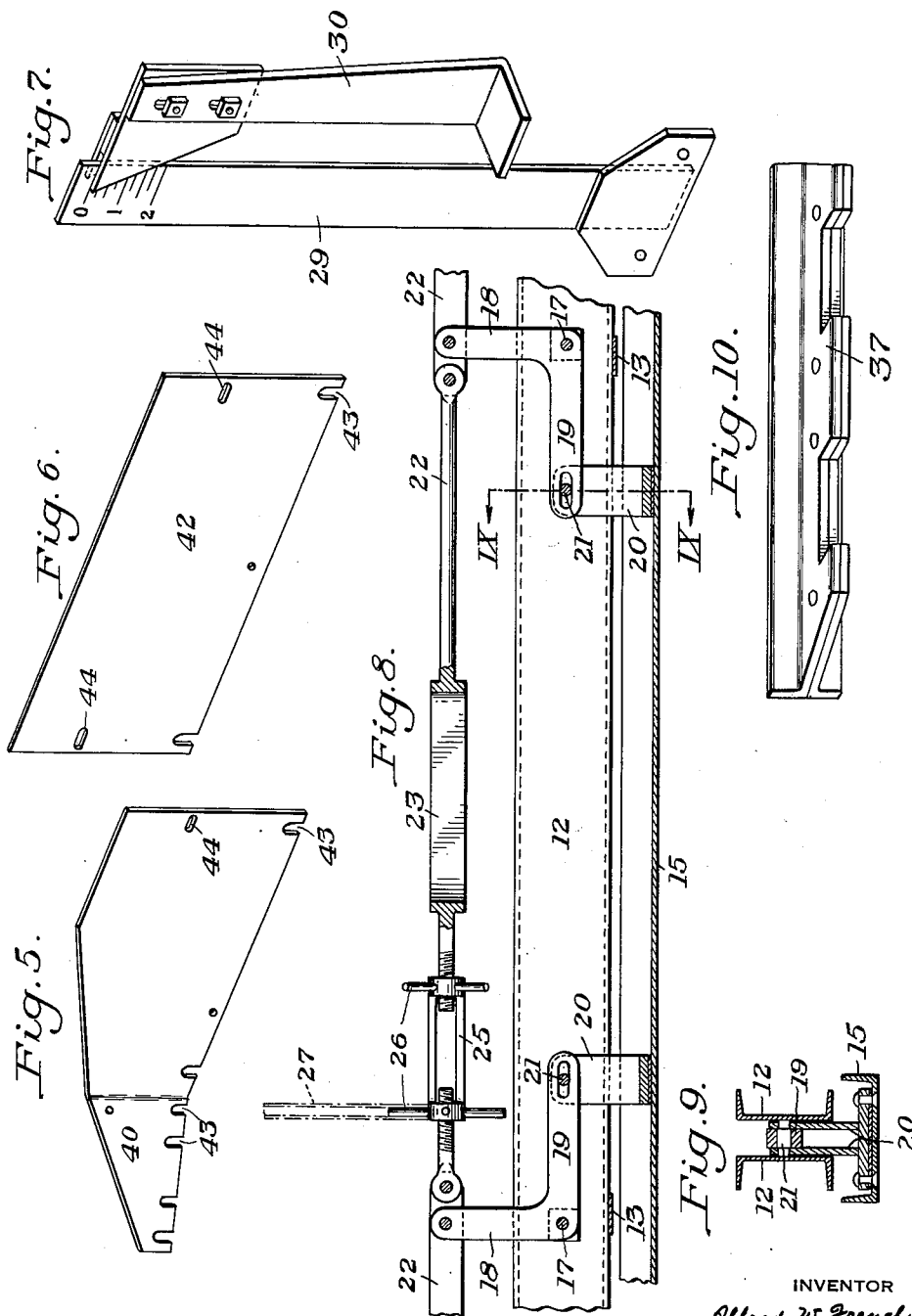
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2 Sheets-Sheet 2



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## UNITED STATES PATENT OFFICE

1,995,450

## ADJUSTABLE SCREED

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Application August 19, 1933, Serial No. 635,866

8 Claims. (Cl. 94-45)

This invention relates to a screed which may be employed for imparting the desired contour to material being shaped, more particularly to materials being poured for building a concrete road.

On concrete roads as generally built in the past, the roads are crowned from one inch to two inches in the center, depending upon the width of the road. Such a contour insures good drainage from the center to both sides when the road is otherwise level.

Until recently, roads were also crowned on the curves; but the engineering practice in this regard is now being modified so that curves are frequently banked from the inner side of the road to the extreme outer edge. For this and other reasons, the crown at the center of the road may be completely eliminated, so that in the middle of a curve, the road surface conforms to a straight line from edge to edge.

At the present time, engineers prefer to retain the crown on the roads where the latter are straight, and to eliminate the crown on curves where the curve is banked. To give a workmanlike finish to the road, it is desirable to have a gradual transition from the crown section to the straight section. The necessity of accomplishing this transition has slowed up the work of shaping the concrete at the curved portions of the road. Various expedients have been adopted for supplementing the screed used where the road is crowned.

The purpose of the present invention is to do away with such delay at the curve of a road and to make it possible to use the screed for the entire road, changing with facility the crown of the screed in passing from the straight road to the curved portion. In fact, in accordance with my invention, the screed is adjustable so that the contour or crown may be changed by the operator of the finishing machine while the latter is in motion performing its ordinary function.

In the drawings in which an illustrative embodiment of my invention is shown,

Fig. 1 is a plan view, a portion of the screed at the right end being broken away;

Fig. 2 is a similar view in side elevation;

Fig. 3 is a detail view with parts in section illustrating the manner in which the contour is adjusted;

Fig. 4 is a section on the line IV-IV of Fig. 2; Figs. 5 and 6 are detail views of face plates for striking off surplus material;

Fig. 7 is a detail view of an indicator from

which the operator may read the crown or contour directly;

Fig. 8 is a detail view similar to Fig. 3 showing the yoke and turn buckle forming part of the operating mechanism;

Fig. 9 is a sectional view on line IX-IX of Fig. 8; and

Fig. 10 is a perspective view of a stiffening angle.

The screed is to extend from one side of the road to the other, and accordingly has what may be considered a back-bone or main frame built up as indicated in Fig. 4 of two channels 12, 12 spaced apart with their stiff sections or webs vertically disposed. Suitable ties 13 extend across to brace the two channels 12.

In order to provide a shaping or smoothing member which may be used to impart a contour or crown of desired shape to the road, this smoothing member is made deformable; and in the embodiment illustrated is a channel 15 secured beneath the back-bone or framework with its flexible section or web horizontally disposed. The elongated smoothing member 15 is connected to the pair of channels 12 in such manner that this deformable smoothing member may be bent or sprung to the desired shape. At points spaced longitudinally of the elongated smoothing member or strip 15 are pivots 17 between the channels on which are mounted bell cranks 18, 18' and 18''. The horizontal legs 19, 19' and 19'' of the bell cranks 18 are not all of equal length and are connected to the strip or channel 15 by uprights 20. The connection between each upright 20 and the corresponding bell crank is shown as a pin and slot connection 21 to provide the necessary lost motion. These bell cranks function as adjusting elements for determining the contour of the elongated smoothing member 15. As these bell cranks constitute connections between the main frame and the smoothing member 15, by rocking the bell cranks about their pivots 17 the various portions of the strip or elongated smoothing member 15 will be displaced relative to the main frame. As the horizontal legs 19, 19' and 19'' of the bell cranks are not all of equal length, the different portions of the channel or strip 15 are displaced to different extents. Adjacent the ends of the strip 15 are pivots 17' on which are directly pivoted uprights 20', thus pivotally connecting the ends of the strip 15 to the rigid frame.

I have provided mechanism for rocking all of the bell cranks simultaneously. Rods 22 extend in opposite directions from a central yoke 23, and the upstanding legs of the bell cranks are piv-

otally connected to the rods 22. A turn buckle 25 is inserted in one of the rods 22 so that by tightening or loosening the turn buckle 25, the bell cranks may be simultaneously rocked on their pivots 17.

The turn buckle 25 is preferably formed with a plurality of radial lugs 26 which, as indicated in Fig. 8, may be engaged by a pipe 27, which makes it easier for the operator to adjust the turn buckle without stooping. For convenience in positioning the radial lugs 26, a portion of them are disposed at the right end of the turn buckle and the remainder at the left end.

It is desirable to have an indicator which will inform the operator at all times as to the contour of the road. This is of particular convenience as the finishing machine is approaching a turn in the road, and where the crown is gradually eliminated to merge with the level surface of a banked turn. I have provided such an indicator mounting the calibrated element 29 thereof on the channel 15 and the pointer element 30 thereof on the main frame of the screed. Either one of these elements may be mounted on the main frame with the other element mounted on the channel 15; but I prefer the arrangement illustrated.

In finishing the road, the screed may be moved longitudinally of the road by hand, but preferably the screed is operated by the usual finishing machine. At the center of the screed I have provided a mounting 32 for a universal coupling 33. The mounting 32 is constructed by securing a plate 35 to the channels 12, fixing a casting 36 to the plate 35 and stiffening the structure by a stiffening angle 37. The universal coupling 33 is mounted on the casting 36, and functions to impart oscillatory motion from a pitman (not shown) to the screed. The crank arm which actuates the pitman may not be precisely aligned with the screed and, therefore, a universal coupling at this point is desirable. The method of connecting the screed provided by my invention to the finishing machine forms no part of my invention and hence further detailed description of the universal coupling 33 is deemed unnecessary.

This structure at the center of the screed makes it impossible to extend the rods 22 continuously across the top of the screed. The yoke 23 is provided so as to pass around this central structure.

As the screed is advanced and oscillated, it may be guided by operators, handles 39 being provided at the ends of the screed. It will be understood that the structure at the right end of the screed is the same as the structure at the left end, the showing of the structure at the right end being omitted so that the drawings may be made on a larger scale.

At each end of the screed there is a shoe or apron 40 for keeping the wet mix from spilling over the top of the road rail. A series of face plates 42 extends across the front of the screed. These face plates bear against a flange of the channel 15 as shown in Fig. 4; and slots 43 and slotted holes 44 are provided for the bolts which secure the face plates to the frame. These bolts merely prevent displacement of the face plates 42 and are not drawn up sufficiently tight to interfere with the adjustment of the curvature of the strip or channel 15.

Certain of the advantages of my invention arise from the provision of a deformable strip or smoothing member whose contour may be determined by connections spaced along its length. Further advantages arrive from the ability to ad-

just the curvature of this smoothing member by the operation of a single member which is conveniently located where the operator may effect such adjustment without moving from his seat on the finishing machine.

While I have illustrated and described one preferred embodiment which my invention may assume, it will be understood that my invention is not limited to the details of such embodiment, and that more particularly my invention is not limited to the structure provided for attachment of the pitman actuated by the finishing machine which is present on finishing machines where my invention is not used, and is described herein only to make clear the reason for the yoke 23; but my invention may be otherwise embodied and practiced within the scope of the following claims.

#### I claim:

1. In a screed, the combination with a rigid frame of a deformable elongated smoothing member adapted to engage the material and means for bending said smoothing member to impart a desired curved contour to said member, said means comprising a plurality of bell crank connections at spaced points along the length of said smoothing member, and a single operating member for simultaneously adjusting said connections.
2. In a screed, in combination, a rigid frame, a flexible elongated smoothing member, and means for bending said smoothing member to a desired curvature comprising a plurality of pivotally mounted bell cranks spaced longitudinally of said smoothing member and supporting said member from said frame, and means for rotating said bell cranks on their pivots.
3. In a screed, in combination, a rigid frame, a flexible elongated smoothing member, and means for supporting said member from said frame comprising a plurality of bell cranks spaced longitudinally of said smoothing member, not all of the legs of said bell cranks connected to said smoothing member being of equal lengths whereby displacement of different portions of the smoothing member may be effected to different extents.
4. In a screed, in combination, a rigid frame, a deformable elongated smoothing member, and means for springing said member to a desired curvature comprising a plurality of bell cranks pivotally connected to the frame and the smoothing member and means including a turn buckle for simultaneously rocking said bell cranks.
5. In a screed, in combination, a rigid frame, a deformable elongated smoothing member adapted to engage the material, means for supporting said smoothing member from said frame and flexing said member to a desired curvature comprising a plurality of bell crank connections between said frame and smoothing member at spaced points along the member, said connections being operable to displace the adjacent portions of said member not all to the same extent, and means for simultaneously operating said connections.
6. In a screed, in combination, a rigid frame, a flexible elongated smoothing member pivotally connected adjacent its ends to said frame, means for bending said smoothing member to a desired curvature comprising a plurality of bell crank connections at spaced points along said member, and means for simultaneously operating said connections to displace the corresponding portions of said member.
7. In a screed, in combination, a rigid frame, a deformable elongated smoothing member, means for springing said member to a desired curvature

comprising a plurality of bell cranks, not all of the legs of said bell cranks connected to said smoothing member being of equal length, and means including a turn buckle for simultaneously rocking said bell cranks.

5 8. In a screed, the combination of a rigid frame, a deformable elongated smoothing member adapted to engage the material, means for supporting said smoothing member from said frame

and for flexing said member to a desired curvature comprising connections between said frame and smoothing member at spaced points along the member, at least one of said connections being of such character as to flex the member to a different extent than the adjacent connections, and a single operating member for operating said connections.

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