Oct. 20, 1942. A. S. MILLIKIN ET AL 2,299,700

SCREED UNIT

Filed July 30, 1940 2 Sheets-Sheet 1

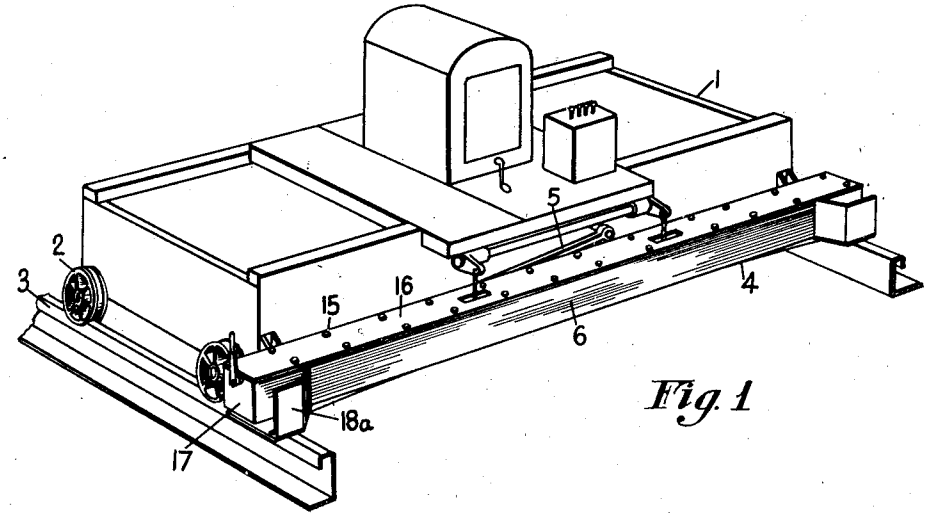


Fig. 1

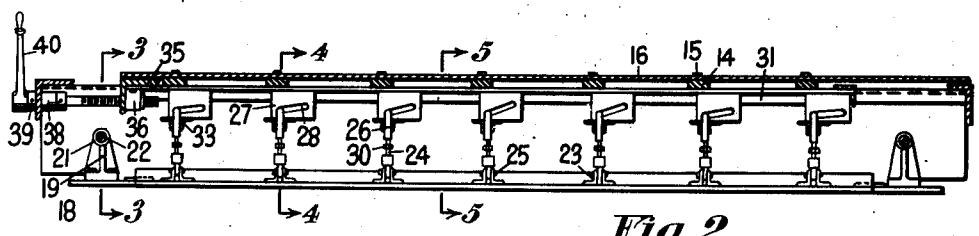


Fig. 2

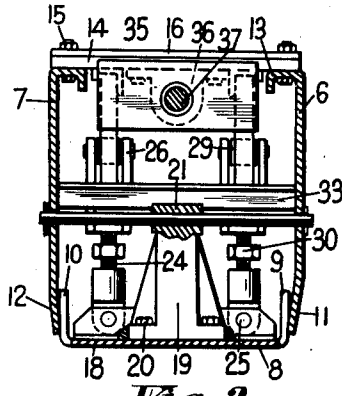


Fig. 3

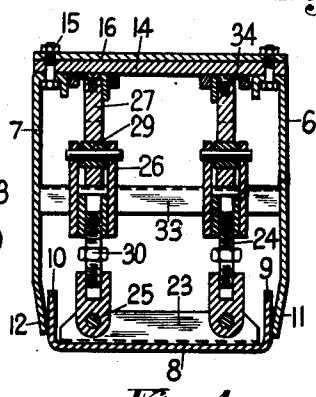


Fig. 4

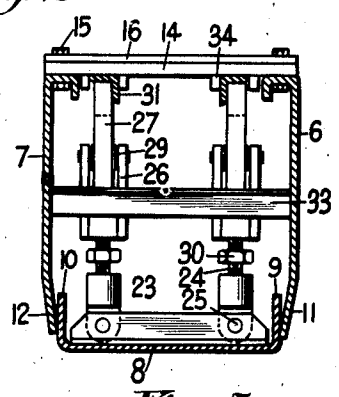


Fig. 5

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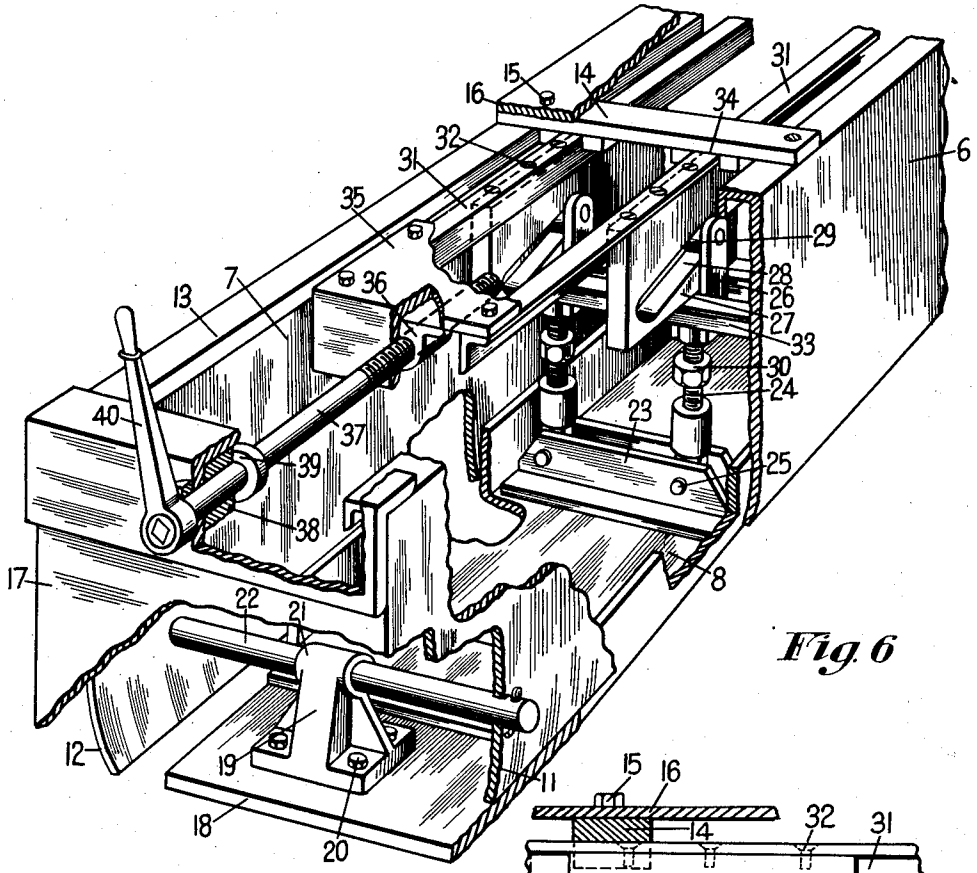


Fig. 6

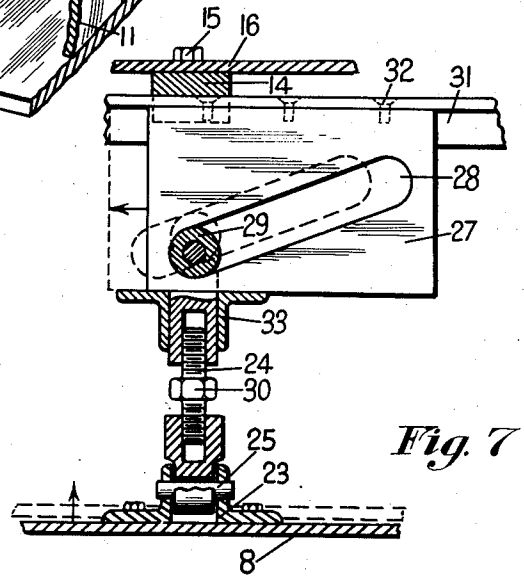


Fig. 7

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UNITED STATES PATENT OFFICE

2,299,700

SCREED UNIT

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Application July 30, 1940, Serial No. 348,376

4 Claims. (Cl. 94—45)

Our invention relates to a screed unit. It has to do, more particularly, with a screed unit for road finishing machines which will effectively finish the surface of a layer of plastic material, such as concrete or asphalt, and will impart the desired crown thereto.

One of the objects of our invention is to provide a screed unit which has a finishing surface that may be easily and quickly adjusted so that it will produce accurately any desired and predetermined crown on the surface being finished.

Another object of our invention is to provide a screed unit of the type indicated wherein means is associated with the surfacing member for quickly adjusting the surfacing member to curve it as desired so that the crown on the surface of the road being produced thereby may be readily and quickly changed during operation of the machine on which the screed unit is mounted.

Another object of our invention is to provide a screed unit of the type indicated in the preceding paragraph wherein the means for changing the crown of the surfacing member is simple, very effective and accurate.

Another object of our invention is to provide a screed unit of the type indicated wherein the crowning means for the surfacing member serves to curve such member the same at its front end rear edges so as to produce a symmetrical curve.

Another object of our invention is to provide a screed unit which has means associated with the finishing surface for tilting it transversely of itself so that its forward and rear edges will be at different levels in order to obtain a troweling action on the material being finished.

Another object of our invention is to provide a screed unit which is of such a nature that it will function both during forward movement of the machine on which it is mounted and rearward movement of the machine.

Another object of our invention is to provide a screed unit which is of very simple construction but which will readily withstand all the shocks and stresses to which it is subjected.

In its preferred form, our invention contemplates the provision of a screed unit which is constructed substantially as a box girder or beam. It embodies a forward plate and a rear plate which are vertically disposed in spaced relationship. The forward plate will contact with the material that piles up in front thereof, during the forward movement of the machine on which the screed unit is mounted, while the rear plate will contact with the material that piles up against it during the rearward movement of the machine. The forward and rearward plate not only serves to contact the material, as indicated, but also serves to support the bottom finishing or surfacing plate. The surfacing plate extends longitudinally of the front and rear plate and is disposed therebetween at the lower edges thereof.

The surfacing plate is suspended from the front and rear plates by means of a plurality of independently adjustable suspending members. These suspending members may be initially adjusted to position the surfacing member relative to the front and rear plates as desired. For example, they may be adjusted to move the surfacing plate vertically relative to the other plates, to tilt it transversely, or to curve it longitudinally. I prefer to have means associated with the suspending members for quickly adjusting all of them simultaneously in order to change the curvature or crown of the surfacing member so that the crown of the road surface may be changed during operation of the machine. The surfacing member may be quickly changed to any extent from its maximum crown to a flat surface, or vice versa.

The preferred embodiment of our invention is illustrated in the accompanying drawings wherein similar characters of reference designate corresponding parts and wherein:

Figure 1 is a perspective view illustrating a surfacing machine having a screed unit, constructed according to our invention, applied thereto.

Figure 2 is a longitudinal sectional view taken through the screed unit and illustrating mainly the means for quickly changing the crown of the surfacing member.

Figure 3 is a transverse sectional view taken substantially along line 3—3 of Figure 2.

Figure 4 is a transverse sectional view taken substantially along line 4—4 of Figure 2.

Figure 5 is a transverse sectional view taken substantially along line 5—5 of Figure 2.

Figure 6 is a perspective view, partly broken away, of one end of the screed unit illustrated in Figure 1.

Figure 7 is an enlarged detail, partly in vertical section and partly in side elevation, illustrating one of the units employed in changing the crown of the screed.

With reference to the drawings, we have illustrated in Figure 1 a finishing machine which may be designated generally by the numeral 1, and which is supported by wheels 2 for operation upon side forms 3. A screed unit, which may be indicated generally by the number 4, is suitably supported at the front of the finishing machine

in such a manner that it may be reciprocated transversely of the path of movement of the machine. The screed unit is adapted to rest on the side forms during reciprocation by means of the mechanism indicated by the numeral 5.

The structure of the screed unit 4, shown in Figure 1, is clearly illustrated in Figures 2 to 7 inclusive. The screed unit is preferably constructed in the form of a box girder or beam. It comprises a vertically disposed front plate 6 and a vertically disposed rear plate 7 which extends the full length of the screed unit and which are disposed in spaced relationship. Disposed between the plates 6 and 7, at the lower edges thereof, is the surfacing plate 8 which extends the full length of the plates 6 and 7. This plate 8 is flexible and is provided with a short upturned flange 9 at its forward edge and a short upturned flange 10 at its rear edge. The lower edge of the plate 6 is bent inwardly as at 11 to a slight extent and the lower edge of the plates 7 is similarly bent as at 12. The portions 11 and 12 will always overlap the flanges 9 and 10. The upper edge of each of the plates 6 and 7 is turned inwardly and then downwardly as indicated at 13 for reinforcement of the plates. The plates 6 and 7 are secured together at their upper edges by means of a plurality of bars 14 which are spaced longitudinally thereof and which extend transversely thereof. These bars 14 are suitably bolted by means of bolts 15 to the upper edges of the plates 6 and 7. A cover plate 16 may also be provided which extends for the full length of the plates 6 and 7 and which is also bolted thereto by means of the bolts 15. Each end of the screed unit is preferably closed by means of a plate 17 which is suitably bolted to the ends of the plates 6 and 7.

Thus, it will be apparent that the screed unit is in the form of a box girder or beam which may be made of less material than prior art screeds. It will still have adequate strength to resist the strains and stresses to which it will be subjected during use. During forward movement of the machine, the front plate 6 will contact with the material which piles up in front thereof. During rearward movement of the machine, the rear plate 7 will similarly contact the material. Thus, the plates 6 and 7 serve both as material contacting plates and as supporting means for the surfacing plate 8, which is suspended therefrom in a manner to be described hereinafter, and no additional supporting beams are necessary as with prior art structures.

The means for supporting the surfacing plate 8 from the plates 6 and 7 will now be described in detail. Each end of the plate 8 is provided with a section 18 of wear resisting steel which is adapted to rest on the adjacent form 3. This section is extended forwardly beyond forward plate 6 and is provided at its forward edge with a vertically disposed end shoe 18*a* which prevents the material from being spread beyond the end of the screed unit. The section 18 is preferably welded to the plate 8. Each end of the plate 8 is hinged to the plates 6 and 7 by means of a bracket 19 which is bolted at 20 to the section 18. This bracket has a sleeve 21 formed on its upper end which receives a hinge pin 22. This hinge pin passes through aligning openings formed in plates 6 and 7 at a point spaced a substantial distance above the lower edges thereof. Thus, the two ends of the plate 8 will be hingedly connected to the plates 6 and 7.

For quickly changing the crown of the plate 8, I provide the following structure. This structure comprises shoe members 23 which extend transversely of the plate 8 and are secured to the upper surface thereof. Each of these shoe members has a pair of turnbuckles 24 secured thereto at the forward and rear ends thereof. Each turnbuckle 24 has its lower end pivoted to the shoe 23, as at 25. The upper end of each of the turnbuckles is provided with a yoke 26 which straddles a cam member 27 that is provided with an inclined cam slot 28. The yoke 26 carries a roller 29 on its upper end that operates in the cam slot 28. It will be apparent that the distance between the roller 29 and the pivot pin 25 will be varied easily by rotating the nut 30 of the turnbuckle.

It will be apparent that the turnbuckles 24 are arranged in two longitudinal rows and in pairs. The cam plates 27 are vertically disposed and are similarly arranged. Each row of cam plates is carried by a longitudinally carried angle member 31. The upper edge of each cam member 27 is secured to the angle member 31 by means of screws 32. The lower edges of the cam plates 27 rest on transverse bars 33 which are secured to the plates 6 and 7. The upper edges of these cam plates together with the angle members 31 will be disposed in guide ways 34 formed on the lower surface of bars 14 adjacent the front and rear ends thereof. The angle members 31 are connected together at each end by means of brackets 35. One of these brackets 35 carries a threaded sleeve 36 which receives a threaded shaft 37. This shaft extends through a bearing 38 in the outer wall of the screed member and is provided with collar portions 39 which prevent longitudinal movement therethrough. The extreme outer end of the shaft 37 carries a ratchet lever 40 by means of which the shaft may be rotated.

It will be apparent that if the shaft 37 is rotated by means of the lever 40, the cam plate 27 will be slid longitudinally between the bars 14 and 33. The bars 33 are arranged in pairs on opposite sides of the yoke 26 so as to prevent movement of the yokes in the direction of movement of the plates 27. Movement of the cam plates 27 will cause the rollers 29 to occupy different positions in the slot 28. Consequently, an upward pull or a downward thrust, depending upon the direction of movement of the cam plates, will be exerted on the turnbuckles 24. This will cause the plate 8 to be bowed to a greater extent or to be flattened out to a greater extent as desired. During this adjustment of the plate 8, it will be pivoting about the pivot pins 22. The cam plates 27 are preferably disposed in the manner illustrated in Figure 2. The middle plate 27 preferably has a slot 28 with the greatest inclination. The inclination of the slots in the successive cam plates towards the outer ends of the screed unit preferably decrease until the outermost plates have slots which are almost horizontal. This will produce a gradual curvature or crown in the plate 8.

The turnbuckles 24 may be adjusted initially so that, as indicated in Figure 2, when the plates 27 have been moved as far as possible to the right with the rollers 29 in the lowermost ends of the slots 28, the plate 8 will be flat. Then when the plates 27 are moved to the left, the curvature of the plate 8 will gradually increase. However, the turnbuckles may be initially adjusted so that the plate 8 will be initially curved. The two rows of turnbuckles may be adjusted to the same extent

so that the forward and rear edges of the plate 8 will be at the same level or one row may be adjusted more than the other so that the plate 8 will be tilted transversely. For example, they may be adjusted so that the forward edge of the plate is slightly higher than the rear edge which will produce a more effective contacting action as the machine advances forwardly. The tilted position of the surfacing plate will not be varied even during the changing of the crown by movement of the cam plates. Furthermore, because two rows of the turnbuckles and cam plates are provided, there will be no danger of accidental tilting of the surfacing member while the screed unit is in use. Also, because of the two rows of adjusting members, the crowning means will serve to apply equal pressure to the front and rear edges of the surfacing member and produce a symmetrical curve.

It will be apparent from the above description that we have provided a screed unit having many advantages. A number of important advantages have been pointed out in the description and others will be apparent from the drawings, and the following claims.

Having thus described our invention, what we claim is:

1. A screed unit comprising a supporting structure, a longitudinally extending surfacing member which is flexible so that it may be bowed, a plurality of rod members for suspending said surfacing member from said supporting structure, said rod members being arranged in two rows adjacent the forward and rear edges of said surfacing member and having their lower ends connected to said surfacing member, said rod members being disposed at intervals spaced longitudinally of said surfacing member, a vertically disposed cam plate associated with the upper end of each of said rod members, each of said plates having an inclined slot formed therein, each of said rod members carrying a transversely disposed pin adjacent its upper end which extends into the inclined slot of the associated cam plate, a single unit extending longitudinally of said supporting structure at a point spaced above the surfacing member and carrying said cam plates at intervals spaced longitudinally thereof, said unit being mounted on said supporting structure for reciprocation longitudinally relative to said surfacing member, means carried by said supporting structure for reciprocating said unit, the inclination of the slots in the various cam plates varying to produce proper bowing of said surface member upon reciprocation of said unit, said surfacing member having its ends hinged to said supporting structure, each of said rod members being adjustable to vary the length thereof.

2. A screed unit comprising a supporting structure, a longitudinally extending surfacing member which is flexible so that it may be bowed, a plurality of rod members for suspending said surfacing member from said supporting structure, said rod members being arranged in two rows adjacent the forward and rear edges of said surfacing member and having their lower ends connected to said surfacing member, said rod members being disposed at intervals spaced longitudinally of said surfacing member, a vertically disposed cam plate associated with the upper end of each of said rod members, each of said plates having an inclined slot formed therein, each of said rod members carrying a transversely disposed pin adjacent its upper end which extends into the inclined slot of the associated cam plate, a single unit extending longitudinally of said supporting structure at a point spaced above the surfacing member and carrying said cam plates at intervals spaced longitudinally thereof, said unit being mounted on said supporting structure for reciprocation longitudinally relative to said surfacing member, means carried by said supporting structure for reciprocating said unit, and means for securing the ends of said surfacing member to said supporting structure, the inclination of the slots in the various cam plates varying to produce proper bowing of said surface member upon reciprocation of said unit.

3. A screed unit comprising a supporting structure, a longitudinally extending surfacing member which is flexible so that it may be bowed, a plurality of members for suspending said surfacing member from said supporting structure, said members being disposed at intervals spaced longitudinally of said surfacing member and having their lower ends connected thereto, a vertically disposed cam plate associated with the upper end of each of said members, each of said plates having an inclined slot formed therein, each of said members having a portion adjacent its upper end which extends into the inclined slot of the associated cam plate, a single unit extending longitudinally of said supporting structure at a point spaced above the surfacing member and carrying said cam plates at intervals spaced longitudinally thereof, said unit being mounted on said supporting structure for reciprocation longitudinally relative to said surfacing member, means carried by said supporting structure for reciprocating said unit, and means for securing the ends of said surfacing member to said supporting structure, the inclination of the slots in the various cam plates varying to produce proper bowing of said surfacing member upon reciprocation of said unit.

4. A screed unit comprising a supporting structure, a longitudinally extending surfacing member which is flexible so that it may be bowed, a plurality of supporting members for supporting said surfacing member from said supporting structure, said members being disposed at intervals spaced longitudinally of said surfacing member and being connected thereto, an inclined plane member associated with each of said supporting members, each of said supporting members having a portion engaging the inclined plane member associated therewith, a single unit extending longitudinally of said supporting structure and carrying said inclined plane members at intervals spaced longitudinally thereof, said unit being mounted on said supporting structure for reciprocation longitudinally relative to said surfacing member, and means carried by said supporting structure for reciprocating said unit.

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