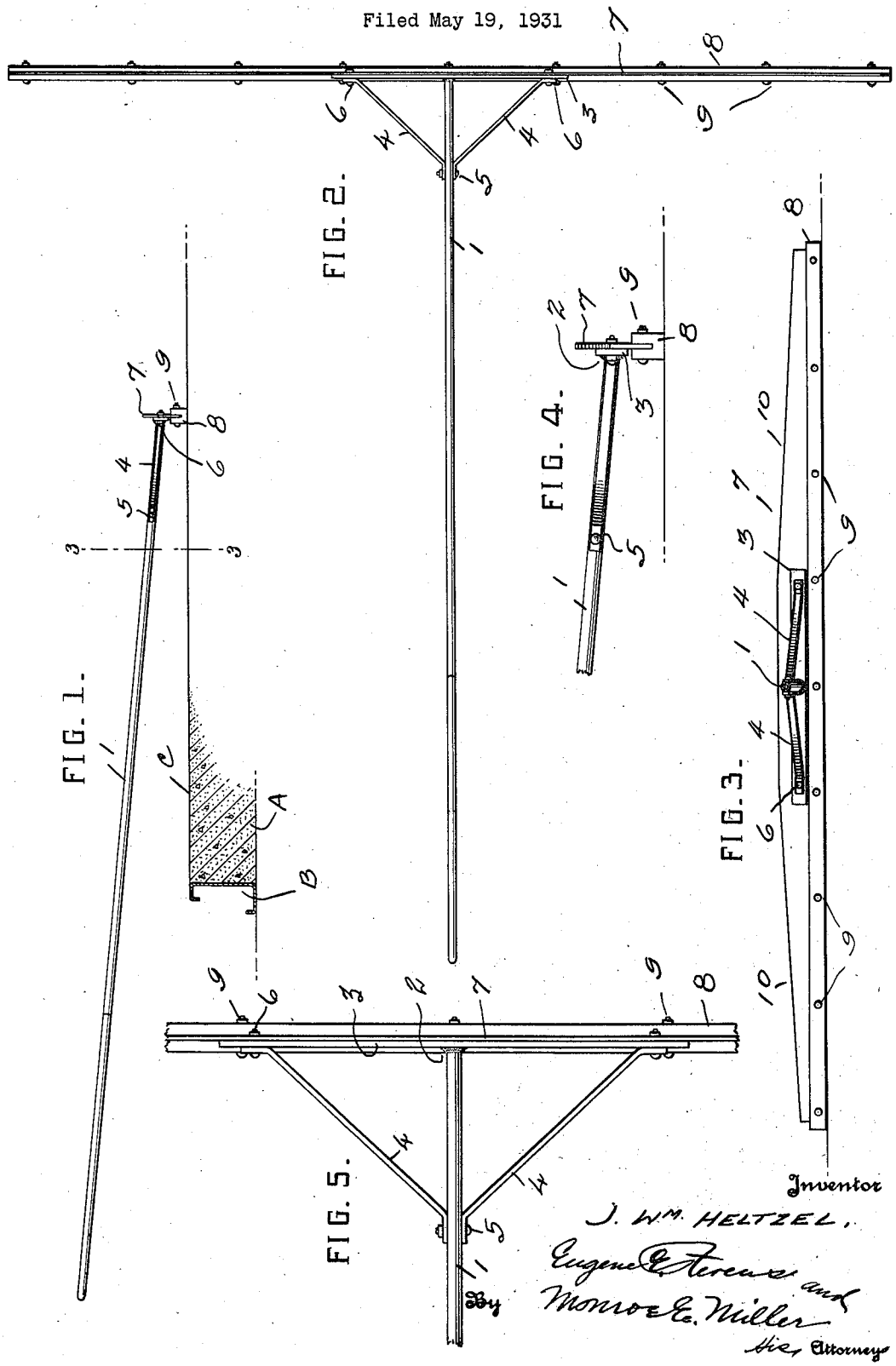
Oct. 29, 1935. J. W. HELTZEL 2,018,890

LUTE

Filed May 19, 1931



Inventor

J. WM. HELTZEL,

By Eugene E. Stevens and Monroe E. Miller

Their Attorneys

Patented Oct. 29, 1935 2,018,890

UNITED STATES PATENT OFFICE

2,018,890

LUTE

Joseph William Heltzel, Warren, Ohio

Application May 19, 1931, Serial No. 538,556

12 Claims. (Cl. 94—45)

My present invention in its broad aspect has reference to improvements in straight-edges or lutes for removing the high spots and smoothing down concrete or other plastic road surfaces.

It has been the practice heretofore to use a relatively long board provided with openings therein, to reduce the weight of the board. Such a board is usually grasped at its ends and moved across the surface of the road to accomplish the purpose desired. However, a board of this character is not only cumbersome to handle, but since the bottom surface or edge of the board is in contact with the wet or damp concrete and the upper or top surface or edge of the board exposed to the rays of the sun, it is only a matter of time before the board becomes warped and twisted and will no longer serve as a straight-edge or lute. Not only that, but such a board is necessarily very heavy despite all efforts to lighten its weight.

Concrete roads of today have been developed to such a degree that an absolutely level surface is required. The most satisfactory tool for working the plastic surface of a concrete road to make it level is a lute provided with a handle, along the lines disclosed in my prior Patent #1,753,414, granted April 8, 1930. However, since most roads are at least 18 feet or more in width, a lute, to be efficient, must have a handle of at least 10 feet in length. Accordingly the tool or straight-edge at the end of the handle must be limited in weight, otherwise the lute is unwieldy. My present invention is not only an improvement upon past methods of working the surface of a plastic concrete road to level the same, but is also an improvement upon my prior patent above identified.

My present invention, more particularly, contemplates the use of a laminated straight-edge, the lower section of which is formed of relatively soft wood as for instance, white pine although other fibrous material and also probably some metal formation may be substituted. This lower section is preferably provided with a vertical incision about three fourths the depth of the section, in which is placed a steel core plate, there being bolts or rivets to hold the core plate in place to form a laminated upper structure which will not warp, which is not appreciably heavier by reason of the steel core plate, and which forms a very desirable part for receiving attaching means for the handle. Furthermore, the handle of my lute is attached to the straight-edge at an angle of about 15 degrees, so that the steel core plate and wooden lower section will remain substantially perpendicular when the opposite end of the handle is grasped by the person manipulating the lute. This also allows for the ready tipping of the straight-edge to more effectively level off the surface of the road after the nature of a trowel, or as termed in the trade "floating" the surface.

Another object of the present invention is to overcome tendency of an all metal straight edge to warp when in use, especially in very hot weather owing to the cooling action of the concrete on the lower edge of the device which causes a shortening and consequent buckling of the upper portion of the straight edge,—this objection having been overcome by the use of reinforcing means in my novel device.

Other objects of my invention will become apparent as this description proceeds, but emphasis is laid upon its simplicity, the fact that new wooden sections may be substituted for worn sections, or the straight-edge of the wooden sections straightened when necessary, and the whole assembly is exceedingly light. Manifestly, certain changes may be made in the structure from time to time, and the right to make such changes is reserved, provided they fall within the scope of what is claimed.

In the drawing wherein is illustrated the preferred form of my invention:—

Fig. 1 is a view of a section of a road-bed with my lute shown in operative relation thereto.

Fig. 2 is a top plan view of the lute.

Fig. 3 is a view on the line 3—3 of Fig. 1, looking toward the rear of the straight-edge.

Fig. 4 is an end view of the lute.

Fig. 5 is a top plan view slightly enlarged to more clearly show the brackets and the method of welding the handle to the steel core.

In the drawing wherein like characters of reference are used to designate like or similar parts throughout the several views:—

The numeral 1 designates a relatively long handle which may be 10 feet or more in length and which is preferably formed of hollow tubing or the like. The front end of the handle is welded as at 2 to a steel plate 3 hereinafter called the "end plate". A pair of angle irons 4 or brackets rise from the ends of the end plate 3 to a point removed from the end of the handle where they are bolted by a bolt or rivet 5, thus forming a stiffening member or reinforcement on each side of the handle. A pair of bolts or rivets 6 extending through the brackets 4 and the end plate 3 to attach the end plate and the brackets and accordingly the handle also, to a hardened

steel core plate 7. Referring now to the straight-edge construction; I provide a lower portion 8 of soft wood, preferably white pine, which may have the following dimensions: width 1½ inches; height 2 inches; and length 10 feet. This wooden section is formed with a vertical incision extending from the top to about ¾ the distance to the bottom edge thereof in which the steel core plate 7 is fitted to form a laminated structure, there being bolts or rivets 9 to complete the assembly of the core plate and wood section. Since the wooden part 8 is laminated or reinforced by the core plate it is impossible for it to warp or twist, and also an exceedingly light straight-edge is provided. Furthermore, the wooden section may be detached by merely removing the bolts or rivets 9. It will be noted that the upper edge of the steel core plate slants down as at 10 toward the ends thereof, so that the core plate has its greatest width at the point where the attaching means for the handle are secured to it. The end plate 3 also prevents warping of the straight edge 7 due to the cooling of the lower edge thereof which is being worked in the concrete while the upper of the straight edge 7 is very hot, as it will be when used during the summer months when the weather is very warm.

Referring now to Fig. 1, the usual plastic concrete road construction is shown at A, the form therefore being shown at B, and the upper surface being designated C. My handle 1 is attached to the core plate at an angle of about 105 degrees as shown in Figs. 1 and 4, thus a person or operator grasping the end of the handle is enabled to keep the lower face of the straight-edge level with the surface of the road as shown in Fig. 1. In operation, the lute is first drawn over the road surface with the bottom surface of the straight-edge held level with the concrete so that the high spots are cut away. This operation is carried out one or more times, depending on the hardness of the concrete until the road surface is level, after which the end of the handle is either raised or lowered, depending on whether or not it is pushed or pulled by the operator. It has been found that after the high spots are removed, the surface is still fairly rough and it is necessary to trowel or float the surface to make it smooth again. The operation of raising or lowering the handle makes the forward edge of the lute tip slightly higher or lower, depending on whether the handle is raised or lowered respectively, and this slight tipping will give a substantial troweling or floating action.

It is believed from the foregoing that the construction and operation of my invention will be apparent to one skilled in the art, but it is again pointed out that the present form of lute attains in a simple and effective structural organization the many desirable and necessary qualities for working a plastic concrete road surface of at least 18 feet or more in width to a level. While a specific construction has been described, in the foregoing it is again emphasized that certain details may be changed and accordingly the scope of the present invention is to be determined only by referring to the claims.

I claim:

1. A lute for smoothing road surfaces, comprising a wood straight-edge formed with a longitudinal incision therein, a steel core plate receivable in the incision and rising above the straight-edge, a handle, a plate connected to the handle, at an angle of substantially 105 degrees to the axis of the handle and said plate connected to the core plate.

2. A lute for smoothing road surfaces, comprising a wood straight-edge formed with a longitudinal incision therein, a steel core plate receivable in the incision and rising above the straight-edge, a handle, a plate secured to the end of the handle, a pair of bracket members connected with the handle at their upper ends, and means extending through the remaining ends of the brackets and through the ends of the plate and through the core plate for attaching the handle to the core plate.

3. A lute for smoothing road surfaces, comprising a wood straight-edge formed with a longitudinal incision therein, a steel core plate receivable in the incision and rising above the straight-edge, a handle, a plate secured to the end of the handle at an angle of substantially 105 degrees with respect to the axis of the handle, bracketing members connected to either side of the handle at a common point on the handle, and means extending through the other ends of the bracketing members and through the plate and core plate for connecting the handle to the core plate.

4. A lute for smoothening road surfaces, comprising a head portion formed in sections, each section being formed of a different material, one section being cut away at its top to provide a groove, the groove having its bottom closed and being adapted to receive the other section in fitted assembly, said first mentioned head portion section providing the bottom of a composite straight edge and the second section projecting above said groove and providing the top of said composite straight edge, and a handle carried by said second mentioned section.

5. A combined straight edge and lute for testing and smoothening road surfaces and comprising an elongated head whose height considerably exceeds its thickness, an elongated handle secured to one side of the head at an angle approximating 105 degrees with the head whereby the operator working from adjacent the outer end of the handle at one side of the roadway may conveniently dispose the head substantially perpendicular to the road surface and also at slight angles to both sides of the perpendicular, said head comprising a plate, a rail-like road surface-engaging shoe member substantially coextensive in length with said plate and having opening from its upper surface a seating recess receiving the lower portion of said plate, and said plate-seating recess of said shoe member providing opposed walls embracing opposite sides of said plate whereby to protect the plate against warping as result of its lower edge contacting wet cool concrete or like while upper part of plate is hot.

6. A combined straight edge and lute for testing and smoothening road surfaces and comprising an elongated head whose height considerably exceeds its thickness, an elongated handle secured to one side of the head at an angle whereby the operator working from adjacent the outer end of the handle at one side of the roadway may conveniently dispose the head substantially perpendicular to the road surface and also at slight angles to both sides of the perpendicular, said head comprising a plate, a rail-like road surface-engaging shoe member substantially coextensive in length with said plate and having opening from its upper surface a seating recess receiving the lower portion of said plate, and said

plate-seating recess of said shoe member providing opposed walls embracing opposite sides of said plate whereby to protect the plate against warping as result of its lower edge contacting wet cool concrete or like while upper part of plate is hot.

7. A combined straight edge and lute for testing and smoothening road surfaces and comprising an elongated head whose height considerably exceeds its thickness, an elongated handle secured to one side of the head at an angle whereby the operator working from adjacent the outer end of the handle at one side of the roadway may conveniently dispose the head substantially perpendicular to the road surface and also at slight angles to both sides of the perpendicular, said head comprising a plate, a rail-like road surface-engaging shoe member, substantially coextensive in length with said plate and having opening from its upper surface a seating recess receiving the lower portion of said plate to a depth equal to at least half the height of said rail, and said plate-seating recess of said shoe member providing opposed walls embracing opposite sides of said plate whereby to protect the plate against warping as result of lower edge contacting wet cool concrete or like while upper part of plate is hot.

8. A combined straight edge and lute for testing and smoothening road surfaces and comprising an elongated head whose height considerably exceeds its thickness, an elongated handle secured to one side of the head at an angle whereby the operator working from adjacent the outer end of the handle at one side of the roadway may conveniently dispose the head substantially perpendicular to the road surface and also at slight angles to both sides of the perpendicular, said head comprising a plate, a rail-like road surface-engaging shoe member substantially coextensive in length with said plate and having opening from its upper surface a seating recess receiving the lower portion of said plate to a depth equal to at least half the height of said rail, said plate-seating recess of said shoe member providing opposed walls embracing opposite sides of said plate whereby to protect the plate against warping as result of lower edge contacting wet cool concrete or like while upper part of plate is hot, and securing means for said plate carried by said plate embracing walls of the shoe.

9. A combined straight edge and lute for testing and smoothening road surfaces and comprising an elongated head whose height considerably exceeds its thickness, an operating handle secured to one side of the head for maintaining one longitudinal head edge in a predetermined working engagement with the road surface, said head comprising a metal plate, a wooden rail-like shoe member substantially coextensive in length with said plate, said shoe member having opening from its upper surface a seating recess receiving the lower portion of said plate and extending substantially throughout the length of same, the bottom of said rail-like shoe member providing an unbroken road engaging straight edge portion for said head, said plate-seating recess of said rail-like shoe member providing substantially coextensive opposed walls embracing opposite sides of said plate whereby to laminatingly strengthen and reinforce the lower working portion of said head, and said shoe and its plate-embracing walls serving to protect the lower portion of the plate from contact with and insulate it from the wet cool concrete of the road surface so as to prevent said plate from warping.

10. A combined straight edge and lute for smoothening and checking plastic road surfaces comprising an elongated, narrow upstanding plate-like head, said head comprising a metal core plate and a coextensive rail-like wooden shoe, said shoe having a top groove receiving said core plate to a depth equal to at least one-half the height of said shoe, said groove terminating short of the bottom of the shoe whereby the latter provides an unbroken road surface-engaging straight edge and lute portion laminatingly reinforced from above by said core plate, and a handle secured to said head.

11. A lute for smoothening road surfaces, comprising a head portion formed in sections, each section being formed of a different material, one section being cut away at its top to provide a groove, the groove having its bottom closed and being adapted to receive the other section, said first-mentioned head portion section providing the bottom of a composite straight edge and the second section projecting above said groove and providing the top of said composite straight edge, and a handle carried by said head portion.

12. A combined lute and straight edge comprising a plate-like head having a narrow edge disposed toward the road surface, said head consisting of upper and lower sections, the lower section being wider than the upper section and having a longitudinal groove in its top surface of a depth approximating one-half the height of said lower section, and the upper section fitting into said groove as a tenon, said sections being of warpable material and the lower section being prevented from warping by the action of the upper section in assembly therewith, and the upper section being prevented from warping by reason of the insulation of the same from the cold wet road by the lower section.

JOSEPH WILLIAM HELTZEL.