June 25, 1929. R. C. THOMASSON 1,718,840

APPARATUS FOR FORMING JOINTS IN CONCRETE ROADWAYS

Filed June 30, 1928

Fig. 1

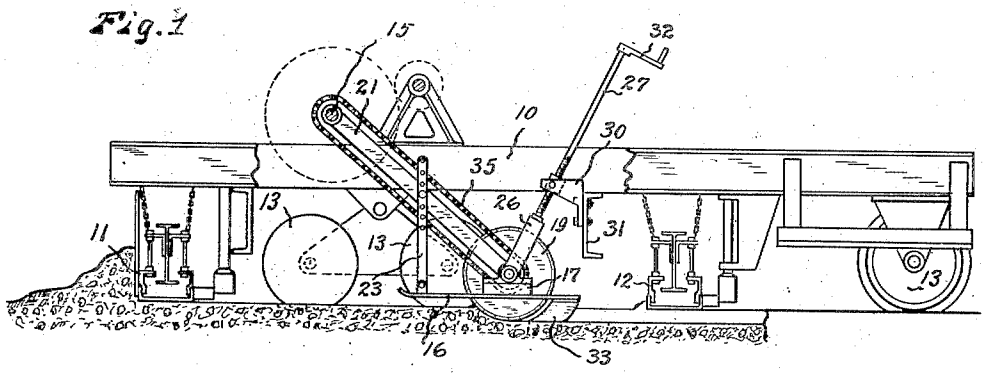
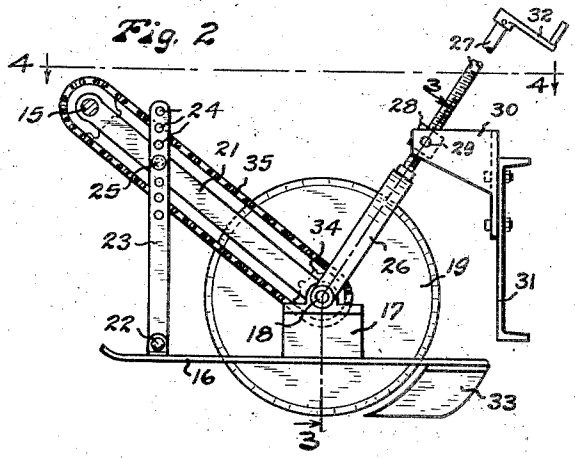


Fig. 2



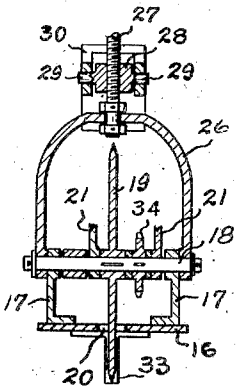


Fig. 3

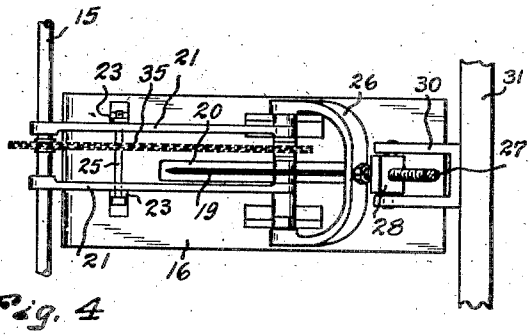


Fig. 4

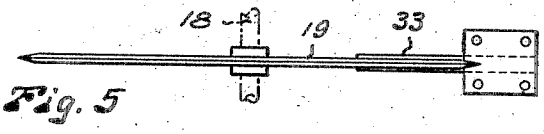


Fig. 5

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR FORMING JOINTS IN CONCRETE ROADWAYS.

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In the making of concrete highways it is common practice to not only form joints therein at intervals that extend from side to side of the roadway but to also form a joint that extends lengthwise and centrally of the roadway. All of such joints are formed of course, shortly after the concrete has been poured and worked into the required position and before it has had time to set or harden. Immediately after the making of such joints strips of tar paper or other suitable material are inserted in and allowed to remain in the joints.

My invention relates particularly to means designed and adapted for forming the said central and longitudinally-extending joints; and it has for its leading object the construction of an apparatus adapted to make such a joint which can be readily attached to, so as to be movable with, the machines now in general use by road contractors for acting upon and shaping or finishing the surface of the freshly laid concrete, the joint-forming apparatus being so constructed, arranged and secured in place on such a machine as not to interfere with the primary functions of that machine. This object I accomplish by the construction and arrangement of parts shown in the drawing and hereinafter fully described. That which I believe to be new will be set forth in the claims.

In the drawing:

Fig. 1 is a side elevation of the frame of a screed type of road-making machine, a portion of such frame being broken away and much of the operating mechanism carried by the frame being omitted, to which frame is operatively connected my improved joint-forming means.

Fig. 2 is a view in side elevation of the joint forming means as shown in Fig. 1 but on a larger scale.

Fig. 3 is a vertical section taken substantially at line 3—3 of Fig. 2.

Fig. 4 is a plan view taken at the line 4—4 of Fig. 2; and

Fig. 5 is a detail, being an edge view of the joint-cutting disc and showing also the block or plow that follows in the joint or groove that the disc makes and by its greater width presses against the walls of such joint or groove to pack the material more tightly.

Referring to the several figures of the drawing—10 indicates the frame of a well-known type of concrete-road finishing machine wherein are employed front and rear screeds that are caused to be vibrated laterally of the roadway for the purpose of acting upon the freshly placed concrete for the purpose of moving it and pressing it to produce the desired surface. These front and rear screeds are indicated generally by the reference numerals 11 and 12. The supporting wheels for the machine are usually six in number and those shown in the drawing are each indicated by 13 and are of a type to adapt them to travel upon the usual side forms or ribbons at the opposite edges of the roadway.

Suitably journaled upon the machine frame 10 and extending transversely thereof is a main drive shaft 15 from which power is taken to operate the finishing screeds and also to drive certain of the supporting wheels to cause the machine to travel in either direction along the said side forms or ribbons. The mechanism for driving the said shaft and also the means for taking power therefrom for the screeds and the driving wheels I have not deemed necessary to show as my invention is not concerned particularly with them. I have therefore only shown so much of the machine as is necessary to illustrate how my improved device is connected in place and operated and to show that when in place it will be so located as not to interfere with the ordinary operation of either of the screeds.

It is to be understood that while my improvements are shown and described in connection with a finishing machine of the general type here illustrated and briefly described the invention is not necessarily limited to an association with that type of machine.

Referring now particularly to the means shown that embody my invention,—16 indicates a plate, to the upper face of which are suitably secured two similar vertical brackets 17, these brackets being located approximately midway of the length of the plate and adjacent to the side margins thereof. These spaced-apart brackets are provided with openings near their upper edges in which is journaled a short shaft that is retained in place by any suitable means. Securely affixed to the central part of the shaft so as to rotate therewith is a disc 19 that projects through a central longitudinal slot 20 in the plate 16.

Two bars, 21, 21, extend from the disc shaft 18 diagonally upward to the main drive shaft 15, these bars being located, respectively, on opposite sides of the disc and each being

loosely mounted on the said two shafts. To the plate 16 near its forward end are pivotally connected as at 22 (see Fig. 2) two standards 23 that respectively rise alongside of the diagonally-arranged bars 21. Each of these standards is provided with a series of holes 24 and in each of the bars 21 is a hole, which last-mentioned holes register with one another and may also register with any of the series of holes 24. A pin 25 passes through two aligned holes of the series 24 and the said holes in the bars 21.

The disc 19 and the slotted plate 16 that the disc projects through are further supported in position by means of a yoke 26 that straddles the disc and is journaled upon the end portions of the short shaft 18. Journaled in the central portion of this yoke and secured by nuts as shown, or in any other suitable manner, is a stem 27 that for a portion of its length is screw-threaded. Such threaded portion passes through a nut 28 that is mounted on trunnions 29, 29, journaled in the walls of a bracket 30 that projects from and is bolted to a cross-bar member 31 carried by the main frame 10 of the machine. To the upper end of the yoke-stem 27 is secured a crank handle 32.

Secured to and depending from the slotted plate 16 and in rear of the disc 19 is a block or plow 33 whose forward edge is preferably curved to conform to the curvature of the disc and is but a short distance from the disc. As clearly shown in Figs. 3 and 5 this member 33 is materially thicker than the disc, which is a matter of importance, as will be hereinafter pointed out.

For attaining the best results I have found that the disc 19 should be positively driven, and to accomplish that I key or otherwise secure upon the shaft 18 that the disc is keyed to a sprocket wheel 34 around which passes a drive chain 35 that also passes over another sprocket wheel fast on the main drive-shaft 15 of the machine.

In operation, before the machine is set in motion to operate the screeds for finishing the surface of the roadway, the disc is to be adjusted vertically so that the longitudinal joint or groove that it is to form in the center of the roadway shall be of the desired depth. To make such adjustment the pin 25 is to be removed from the holes in the standards and inclined bars 21 whereupon the said standards can be drawn up or lowered to change the position of the front end of the slotted plate 16 to the required height, and when that is done the standards and bars will be again secured together by passing the pin through the holes of the standards that are then in registry with the holes in the inclined bars 21. With the change in the parts effected in this manner it is of course necessary that a corresponding change in the height of the rear end be made, for if the rear end of the plate be left lower than the front end it would cause the member 33 to dig into the bottom of the joint or groove and thus make it deeper than desired. The adjustment of the rear end is effected, as will be readily understood, by a turning of the screw-threaded stem 27 by means of its handle 32. The swiveling of the nut 28 through which the stem 27 passes permits the stem to readily assume the necessary inclination or angle required on account of the various levels to which the plate 16 is adjusted from time to time.

It is not intended that the plate 16 shall be in contact with the surface of the concrete, for the diameter of the disc is to be such that even when forming a groove that is as deep as will ordinarily be made, the plate will not be moved down far enough to come in contact with the concrete.

With the parts adjusted as just described and the machine in motion lengthwise of the roadway the disc will be positively driven through the described gearing that is interposed between its shaft 18 and the main drive shaft 15 and thus form a joint or groove of uniform depth in the center of the highway. Closely following in the groove cut by the disc is the block or plow-shaped member 13, which, as before stated, is somewhat thicker than the disc. The object in making it thicker is that by reason of such extra thickness its sides will press firmly against the walls of the joint or groove and therefore tend to pack the material so solidly as to prevent the walls from breaking down in places and the loosened pieces of concrete from falling to the bottom of the joint and thereby making it more difficult to properly position the strips of tar paper in the joint.

In addition to the adjusting function described for the bars 21 and the yoke 26 and its cooperating screw-threaded stem 27, these parts by reason of their being inclined respectively in opposite directions—that is, upwardly toward the front of the machine and upwardly toward the rear of the machine—serve as very effective bracing means for the joint-forming disc and parts connected therewith, which is a very important matter in view of the strains to which the device is necessarily subjected.

What I claim as new and desire to secure by Letters Patent is as follows:

1. In apparatus of the class described, the combination with a wheeled frame of a rotary disc adapted to form a longitudinal groove in the surface over which the frame passes, a plate having spaced-apart members rising therefrom in which is journaled a shaft to which said disc is secured, said plate having a longitudinal slot through which said disc projects, and adjustable means for holding said plate and the disc supported thereby in varying positions relative to the

surface in which the groove is being formed.

2. In apparatus of the class described, the combination with a wheeled frame of a rotary disc adapted to form a longitudinal groove in the surface over which the frame passes, a plate having spaced-apart members in which is journaled a shaft to which said disc is secured, said plate having a longitudinal slot through which said disc projects, driving means for positively rotating said disc, said driving means comprisng a gear on said shaft, a power shaft journaled on said wheeled frame and a drive-chain running over said two gears, and means for holding said slotted plate and the parts connected therewith in different positions relatively to the surface in which the groove is being formed.

3. In apparatus of the class described, the combination with a wheeled frame of a rotary disc adapted to form a longitudinal groove in the surface over which the frame moves, a support for said disc adapted to lie above and out of contact with such surface and approximately parallel therewith, and means for holding and vertically adjusting said support and disc, said means comprising forwardly and rearwardly diagonally-extending bracing members.

4. In apparatus of the class described, the combination with a wheeled frame of a rotary disc adapted to form a longitudinal groove in the surface over which the frame moves, a support for said disc adapted to lie above and out of contact with such surface and approximately parallel therewith, and means for holding and vertically adjusting said support and disc, said means comprising a diagonally extending bar pivotally connected with said wheeled frame and also a yoke having a stem, said yoke and stem extending diagonally in an opposite direction from that of said bar and said stem having an adjustable connection with the wheeled frame.

5. In apparatus of the class described, the combination with a wheeled frame of a rotary disc adapted to form a longitudinal groove in the surface over which the frame moves, a support for said disc adapted to lie above and out of contact with such surface and approximately parallel therewith, a shaft journaled upon said support and to which shaft said disc is non-rotatably secured, a power shaft on said wheeled frame, driving means interposed between said two shafts to compel the positive rotation of said disc, two spaced-apart diagonal bracing bars extending between, and loosely attached to said shafts, said driving means being located between said bars, a yoke straddling said disc and loosely connected at its ends to the shaft of the disc, a stem affixed to said yoke, said yoke and stem extending diagonally upward in a different direction from that of said bracing bars and together forming a bracing element that cooperates with said bars in holding said support and disc in different adjusted positions, and means for separately adjusting and holding said bars and said other bracing means.

6. An apparatus for forming a groove in a body of yielding material such as a freshly-laid concrete roadway, comprising a disc, a block located in rear of and in close proximity to said disc, said block being thicker than the disc, whereby as it is drawn along in the groove that has been formed by said disc it will forcibly press against the side walls of such groove, and a device connecting said disc and block together, said block being maintained in position to keep its lower edge substantially out of digging contact with the bottom of the groove.

7. In an apparatus of the class described, the combination with a wheeled frame of a device supported from the frame adapted to form a longitudinal groove in the surface over which the said frame passes, a longitudinally-slotted plate through which said grooving device extends, means for connecting said plate and grooving device together, and adjustable means for holding said plate and grooving device at different heights relative to the surface in which the groove is being formed.

8. In an apparatus of the class described, the combination with a wheeled frame of a rotary disc adapted to form a longitudinal groove in the surface over which the frame passes, a plate having a longitudinal slot through which said disc projects, a shaft supported from said plate and passing centrally through said disc, two oppositely-extending and adjustable bracing members interposed between said wheeled frame and disc, and a standard adjustably connecting said plate with one of said bracing members, said bracing members and said standard serving to hold said plate and disc in different positions relatively to the surface over which the wheeled frame passes.

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