July 4, 1967 A. N. DEVEREAUX 3,329,073

REINFORCING ROD SPACING MEANS USED IN PAVING

Filed July 2, 1965 2 Sheets-Sheet 1

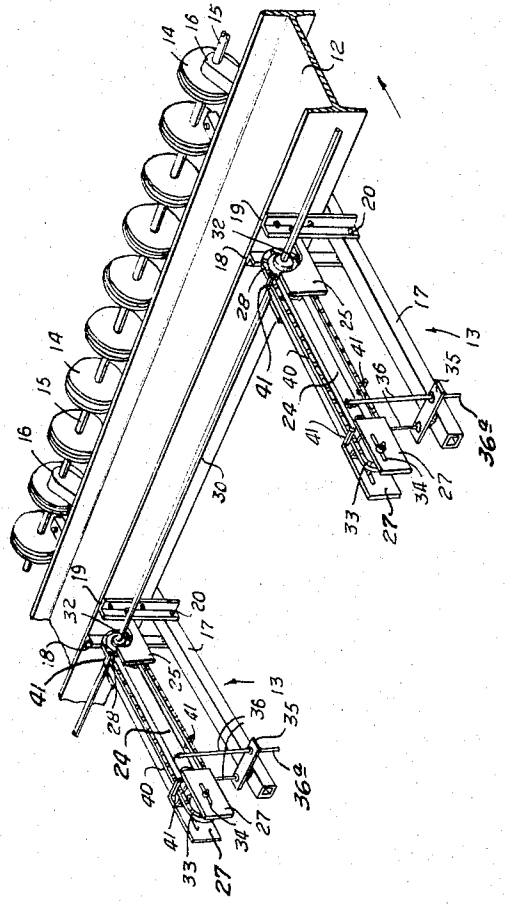


FIG. II

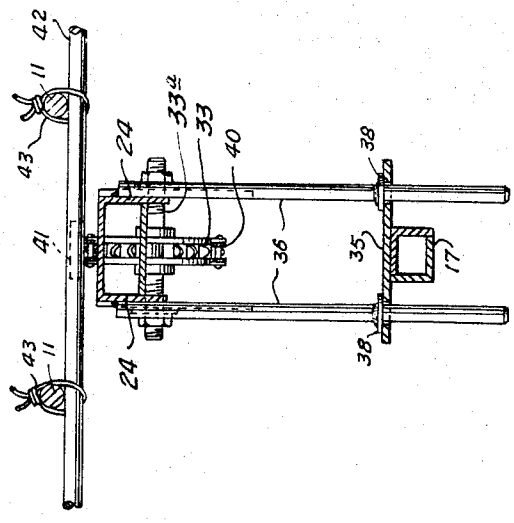


FIG. V

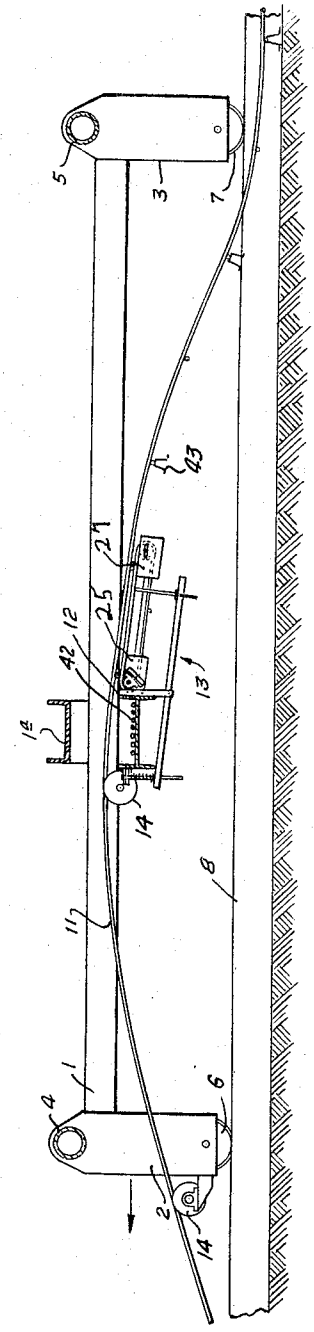


FIG. I

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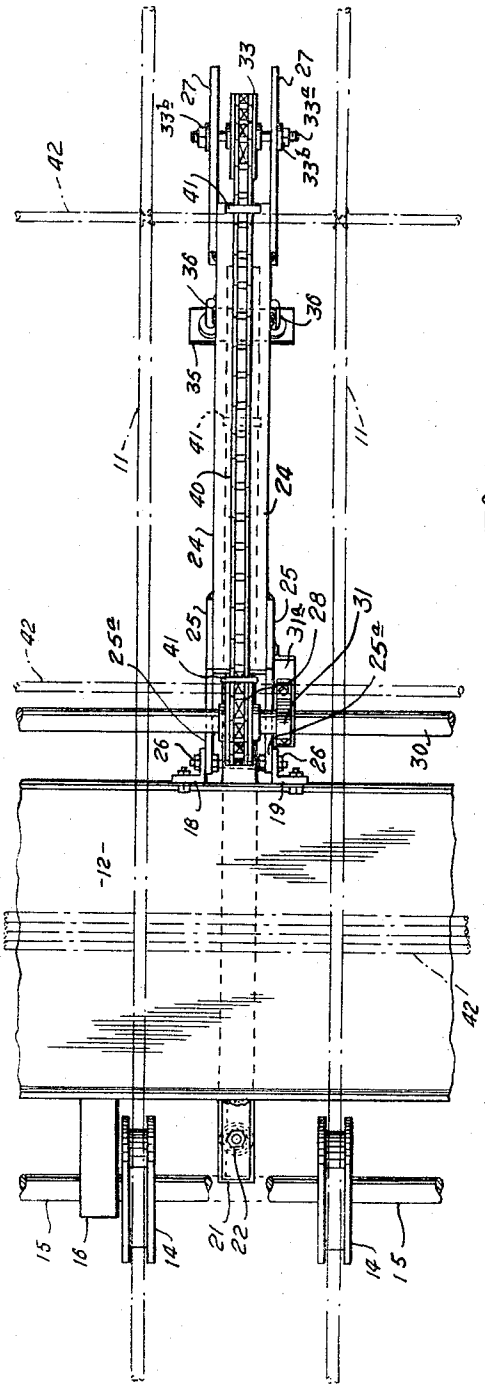


Fig. IV

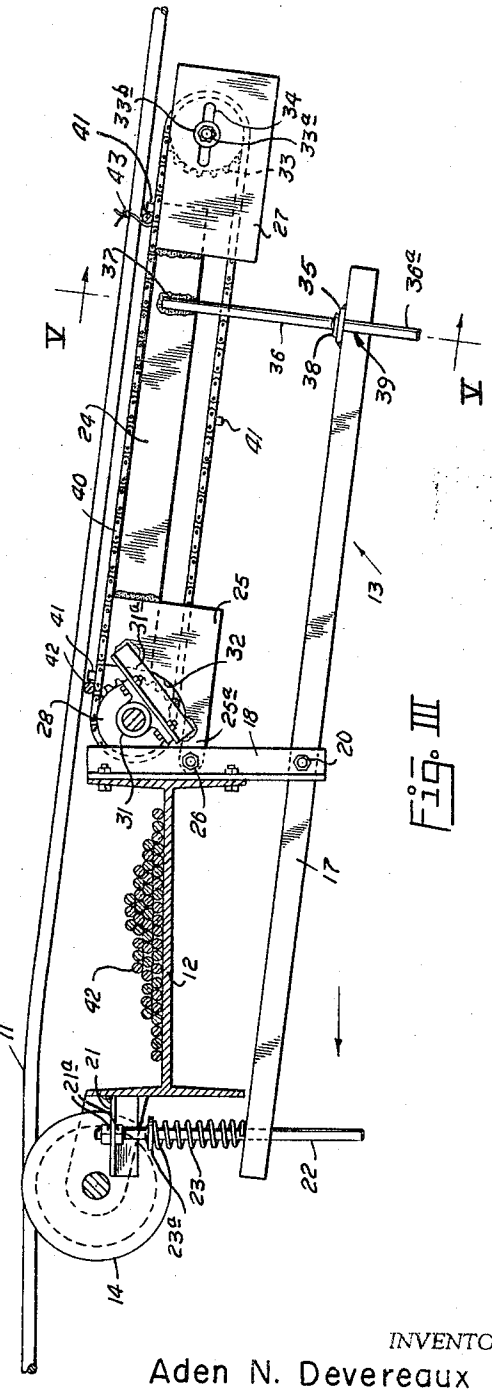


Fig. III

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# REINFORCING ROD SPACING MEANS USED IN PAVING

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8 Claims. (Cl. 94—39)

## ABSTRACT OF THE DISCLOSURE

An improvement on a rod lifting machine for attaching and spacing transverse reinforcing rods on longitudinal reinforcing rods used in concrete paving, as the rod lifting machine moves forward. A plurality of floating supports, each having a chain rotatable thereabout are pivotally mounted at one end to the rod trough on the rod lifting machine. Transversely aligned lugs are provided in spaced relationship on the chains. Transverse reinforcing rods are placed against the lugs as the machine moves forward. The floating supports are spring-urged upwardly to urge the transverse reinforcing rods against the longitudinal reinforcing rods. The transverse reinforcing rods are progressively tied to the longitudinal reinforcing rods as the machine moves forward and the force exerted between the transverse rods and the lugs rotates the chains. The sprockets about which one end of the chains are mounted are affixed to a common shaft to keep the lugs in alignment.

It has been the practice in the past to lay longitudinal reinforcing rods out on the road bed prior to paving. In order to attach transverse reinforcing rods at spaced intervals to the longitudinal rods it has been the practice to lift the longitudinal rods from the road bed by a machine pulled therealong which has spaced, transversely aligned, grooved idler wheels thereon over which the longitudinal reinforcement rods pass as the lifting machine is pulled along the road bed. As the lifting machine is pulled along the road bed to lift the longitudinal reinforcing rods above same, the transverse reinforcing rods have been picked up from a transverse trough on the machine manually and tied to the longitudinal rods.

In the practice of such procedure, the transverse rods, had to be supported manually while being tied to the longitudinal rods, which was a cumbersome procedure, and the spacing thereof was a matter of guess.

As a result such procedure required excessive manpower and time in that extra laborers were required to hold the rods in place while they were being tied by others, and the lifting machine often had to be stopped while the transverse rods were being tied in place.

The present invention provides a plurality of floating supports for the transverse reinforcing rods, which include chain conveyed transversely aligned spacer lugs thereon, which assures that the transverse reinforcing rods are not only supported for tying to the longitudinal reinforcing rods, but assures that the transverse reinforcing rods will be accurately spaced when tied to the longitudinal reinforcing rods.

Such improvement also permits the transverse reinforcing rods to be quickly positioned in contacting relationship with the longitudinal reinforcing rods and quickly tied thereto without the necessity of holding same manually in contact and in aligned relationship, thereby reducing the amount of labor required and the time consumed in attaching the transverse reinforcing rods, so that the transverse reinforcing rods may be attached to the longitudinal reinforcing rods as the lifting machine progressively moves forward, and without stopping or interruption.



It is, therefore, a primary object of the invention to provide means for supporting and accurately spacing transverse reinforcing rods with reference to longitudinal reinforcing rods employed in paving.

Another object of the invention is to provide an improvement in a longitudinal reinforcing rod lifting machine comprised of a plurality of transversely aligned spacer members engageable with transverse reinforcing rods, which aligned spacer members are mounted on rotatable conveyor members carried on a floating frame attached to the machine, and which conveyor members are rotated by the transverse reinforcing rods in engagement with the spacer members by the forward movement of the machine.

Another object of the invention is to provide means for maintaining transverse reinforcing rods in contact with longitudinal reinforcing rods while they are being tied.

A general object of the invention is to provide means for spacing and attaching transverse reinforcing rods to longitudinal reinforcing rods which results in a saving of labor and time.

Other and further objects of the invention, in addition to the foregoing, will become obvious in view of the detailed description hereinafter following and by reference to the drawings annexed hereto.

A suitable embodiment of the invention is shown in the attached drawings wherein,

FIGURE I is a semi-diagrammatic sketch of a longitudinal rod lifting machine being towed along a road bed to which is attached one of the floating transverse reinforcing rod support and spacer frames, constituting the subject matter of this invention;

FIGURE II is a fragmentary perspective view of a longitudinal reinforcing rod lifting machine to which is attached a plurality of floating support and spacer frames for the transverse reinforcing rods;

FIGURE III is a side elevational view of one of the transverse reinforcing rod support and spacer frames attached to a longitudinal spacer rod lifting machine;

FIGURE IV is a top plan view of one of the transverse reinforcing rod support and spacer frames attached to a reinforcing rod lifting machine;

FIGURE V is a vertical sectional view taken along the line V—V of FIGURE III.

Numeral references are employed to indicate the various parts shown in the drawings and like numerals indicate like parts throughout the various figures of the drawings.

Referring first to FIGURE I, the numeral **1** indicates spaced longitudinal side frames for the longitudinal reinforcing rod lifting machine, which are tied together by the end cross braces **4** and **5** and a central cross brace **1***a*.

Spaced wheel supports **2** and **3** are provided at the corners of the frame, said wheel supports **2** and **3** having flanged wheels **6** and **7** rotatably supported thereon which are arranged to engage and run along the side forms **8** positioned at each edge of the road bed between which concrete is to be poured for paving the road bed.

Spaced, transversely aligned, grooved idler wheels **14** are rotatably supported on the frame of the machine, and are in position to receive spaced longitudinal reinforcing rods **11**, which have been previously laid out on the road bed, in order to lift the longitudinal reinforcing rods **11** vertically of the road bed as the machine is towed along the road bed in the direction of the arrow in FIGURE I so as to place the longitudinal reinforcing rods in position whereby transverse reinforcing rods can be tied to the longitudinal reinforcing rods in spaced relationship therealong.

The transverse reinforcing rod trough **12** is provided, which extends between, and is secured to, the side frame

members 1, or may be otherwise supported by the frame of the machine.

A plurality of floating transverse reinforcing rod support and spacer members 13 (described in detail hereinafter) are attached in spaced relationship to the rod trough 12.

The typical longitudinal reinforcing rod supporting idler rollers 14, are shown in detail in FIGURE II. The idler rollers 14, as shown, are attached in spaced relationship on the support shaft 15. The shaft 15 is rotatable in bearings provided in the support blocks 16 which are secured to the side of the rod trough 12. The ends of the shaft 15 are rotatably supported in bearings (not shown) which may either be attached to the face of the rod trough 12 or to the side frames 1.

The other series of idler rollers 9 may be secured in any suitable manner in rotative relationship to the frame, the means of mounting shown in FIGURE II being merely illustrative of a suitable form of mounting for said rollers

Inasmuch as all of the rod support and spacer frames 13 are constructed and mounted exactly alike, a description of one of said frames 13 will suffice for all. Said description is set forth below.

The typical floating frame 13 includes a lower support beam 17 which is pivotaly supported between the vertical brackets 18 and 19 by a pivot bolt 20. The brackets 18 and 19 are secured to the face of the rod trough 12 in a position to extend therebelow.

A mounting bracket 21 is secured to the opposite face of the rod trough 12 and extends outwardly therefrom. A spring support pin 22 is attached at its upper end to the bracket 21 by means of nuts 21*a* threadedly engaged to the pin 22 on opposite sides of the bracket 21. The pin 22 slidably extends through a hole through the beam 17.

A coil spring 23 is disposed between a spring stop 23*a* secured to the shaft 22 and the upper face of the lower support beam 17.

A frame 24, which coinsists of spaced plate members (see FIGURE IV), has end supports 25 secured to the inner end thereof, said end supports 25 having cut-out areas 32 therein providing attachment extensions 25*a* thereon which are pivotally secured to the mounting brackets 18 and 19 by means of a pivot bolt 26.

Rear support plates 27 are secured to the outer ends of the side frames 24, and are arranged to rotatably support the outer sprocket 33 on the axle 33*a* in the manner hereinafter described.

The inner sprockets 28 are secured to a shaft 30 which extends transversely of the machine, and is rotatably mounted in bearing blocks 31 secured to the end supports 25 on angle plates 31*a*, welded to the outer faces of the end supports 25. The inner sprockets 28 of each of the support and spacer frames 13 is secured to the shaft 30 to rotate therewith.

The cut-out areas 32 in the support plates 25 provide space for the mounting of the inner sprockets 28 when assembled on the rod 30, and to permit the shaft 30 to pass through the plates.

The outer sprocket 33 is adjustably mounted with reference to the end plates 27 by means of the longitudinal adjustment slots 34 through said plates in which the axle 33*a* may be longitudinally adjusted to adjust the tension of the chain 40 and may be secured in adjusted relationship by the nuts 33*b* on the threaded ends of the axle 33*a*.

A cross support 35 is secured to the upper surface of the lower support beam 17.

The support pins 36 are secured at their upper ends to the side frames 24 by welding 37.

Each of the support pins 36 has a stop plate 38 secured thereto arranged to engage the upper surface of the lower support beam 17. The lower ends 36*a* of the pins 36, below the stop plate 38, slidably extend through passages 39 provided through the cross member 35, so that the ends 36*a* of the pins 36 are free to move up and down in said passages and the stop plates 38 limit the relative vertical movement between the lower support beam 17 and the pins 36.

A conveyor chain 40 extends about the sprockets 28 and 33 and is arranged to rotate said sprockets in the manner hereinafter described.

A plurality of lugs 41 are secured in spaced relationship on the outer surface of the chain 40 so as to extend outwardly thereof. The lugs 41 provide the spacing between the transverse reinforcing rods 42 in the manner hereinafter described.

The operation and function of the device hereinbefore described is as follows:

The rod lifting machine is placed upon the side forms 8 and the spaced longitudinal reinforcing rods 11 (which have already been laid out on the road bed) are placed over the spaced idler rollers 9 and 10 with the longitudinal rods disposed in the grooves of the idler rollers so that as the machine is pulled forward the idler rollers 14 will roll underneath the longitudinal reinforcement rods 11 and lift them off the road bed.

Before the machine is started forward, a transverse reinforcing rod 42 is placed against aligned lugs 41 at the inner end of frame 13 and tied to longitudinal rods 11 by tie wires 43 so that forward movement of the machine wil cause rods 42 to rotate chains 40.

As the machine slowly moves forward, the workmen, who normally ride on the frame of the machine behind the rod trough 12, will pick up individual transverse reinforcing rods 43 and place them behind aligned lugs 41 on frames 13. The rods are thus accurately spaced and transversely aligned with reference to the longitudinal reinforcing rods 11.

In placing the transverse reinforcing rods 42 on the conveyor chains 40 adjacent the aligned spacer members 41, it will be necessary to force the longitudinal rods 11 upwardly as the transverse reinforcing rod is passed between same and the conveyor chains 40.

As the machine continues to move forward, as shown by arrows in FIGURES I, II and III, the transverse reinforcing rods 42 are tied to the longitudinal reinforcing rods 11 by the tie wires 43 which anchors the transverse reinforcing rod 42 with reference to the longitudinal reinforcing rods 11 and the force exterted therethrough to the lugs 41 causes the conveyor chain 40 to rotate. The lugs 41 separate from the transverse reinforcing rod when said lugs rotate about the outer sprockets 33, leaving the transverse reinforcing rod secured to the longitudinal reinforcing rods in spaced relationship for deposit on the road bed as the machine passes from under the reinforcing rods.

It will be noted that the spring 23 resiliently urges the outer end of the bottom support beam 17 downwardly about the pivot point 20 to resiliently urge the frame 24 upwardly through rods 36 about the pivot point 26. Thereby the frame member 13 is resiliently urged upwardly toward the longitudinal reinforcing rods 11 to assure that there will be contact between the longitudinal reinforcing rods 11 and the transverse reinforcing rod 42 when the transverse rod is placed behind transversely aligned lugs 41, regardless of irregularities in the terrain or irregularities in the curvature of the longitudinal reinforcing rods 11. Thereby the longitudinal and transverse reinforcing rods may be easily tied together.

A slidable joint is provided by the rods 36 and passages 39, which is limited by stop 38 between the rod 36 and the beam 17, so that the frame 24 may move upwardly, or float, with reference to the base support 17 to allow same to conform to the longitudinal rods 11.

Thus, the transversely aligned lugs 41 provide an index for spacing the transverse reinforcing rods 42, the conveyor chains 40 provide a support for such rods and the resilient floating mountings for the frame 13 urges the transverse reinforcing rods into contact with the longitudinal reinforcing rods as they are tied together, and the connected reinforcing rods provide motive power for rotating the conveyor chains for the spacer lugs.

It will be understood that other and further embodiments of my invention may be devised without departing from the spirit and scope of the appended claims.

Having described my invention I claim:

1. In a rod machine for attaching transverse reinforcing rods to longitudinal reinforcing rods, said machine having a transverse rod trough and spaced idler rollers for lifting and guiding longitudinal reinforcing rods over the trough, a plurality of conveyor frames pivotally attached to the rod trough on the opposite side thereof from the idler rollers; spaced sprockets mounted on the frames; a conveyor chain extending about the sprockets, spaced laterally aligned lugs on the outer surface of the chains; and means arranged to resiliently urge the frames upwardly.

2. The combination called for in claim 1 wherein the means to resiliently urge the frame upwardly comprises a beam pivotally carried by the transverse rod trough intermediate its ends; spring means between one end of the beam and the rod trough to urge said end downwardly; and means connecting the other end of the beam and the frame to urge the frame upwardly.

3. The combination called for in claim 2 wherein the means connecting the other end of the beam and the frame is a rod secured at its upper end to the frame and being slidably connected to the beam; and means on the rod to limit relative movement of the beam and the rod.

4. The combination called for in claim 1 with the addition of means to adjust the spacing of the sprockets and thereby the tension of the chain.

5. The combination called for in claim 1 wherein the inner sprockets on the plurality of frames are connected by a common axle extending therethrough.



6. In a machine for attaching transverse reinforcing rods to longitudinal reinforcing rods, said machine including a transverse rod receptacle, and spaced idler rollers for lifting and guiding longitudinal reinforcing rods over the receptacle; a plurality of spaced, parallel longitudinally extending rod supporting frames extending rearwardly of the receptacle; means for pivotally mounting the inner ends of the frames with reference to the receptacle; a plurality of transversely aligned sprockets rotatably mounted at the inner ends of the frames; a plurality of laterally aligned sprockets rotatably mounted at the outer ends of the frames; a chain extending about the sprockets on each frame; and spaced laterally aligned lugs on the outer surface of the chains.

7. The combination called for in claim 6 with the addition of spring means to urge the outer ends of the frames upwardly.

8. The combination called for in claim 6 wherein the inner sprockets are connected by a common axle.


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