Mar. 3, 1925. 1,527,983

K. A. LUNDSTROM

PAVING MACHINE

Filed Sept. 18, 1922 4 Sheets-Sheet 1

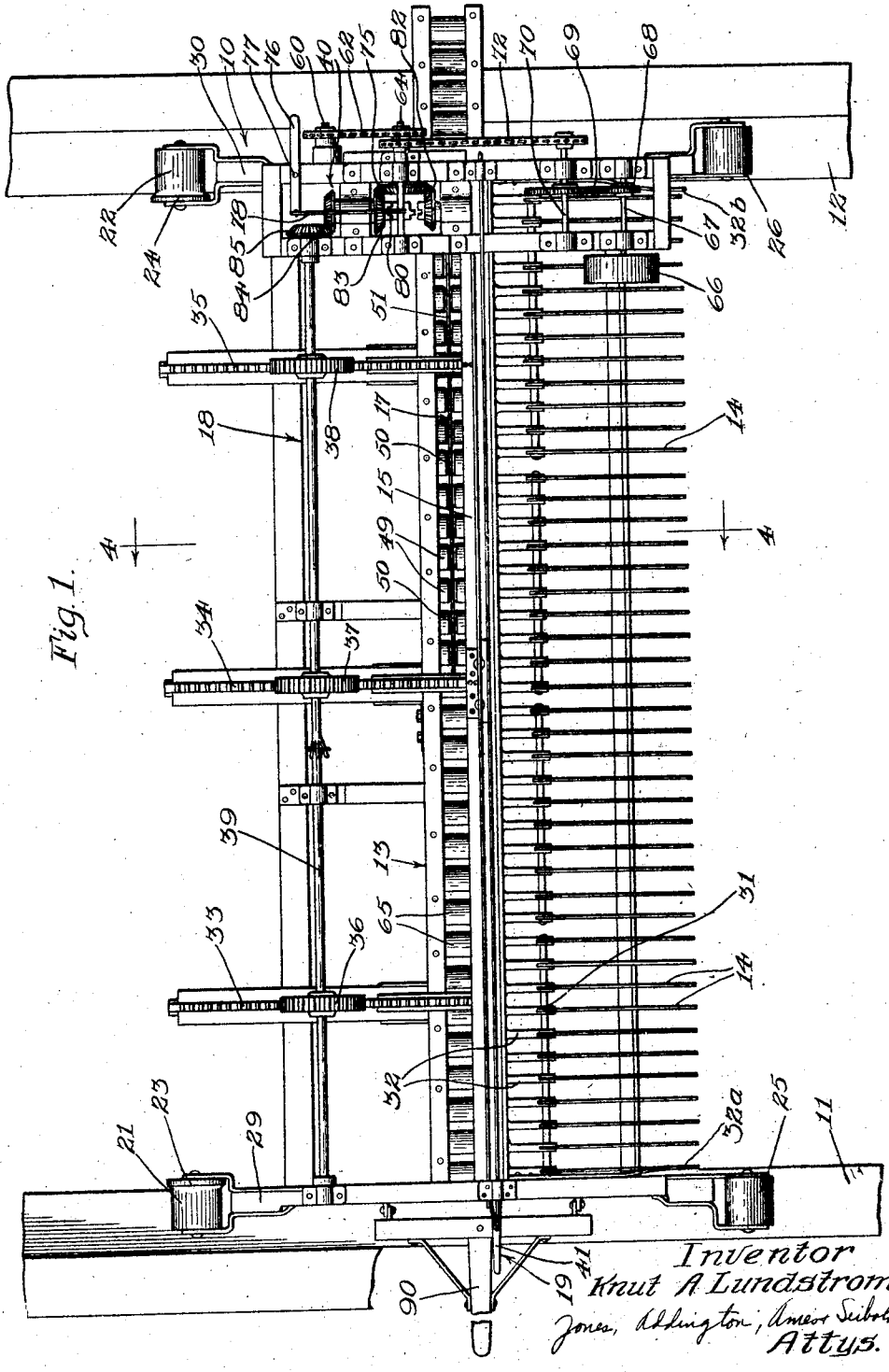


Fig. 1.

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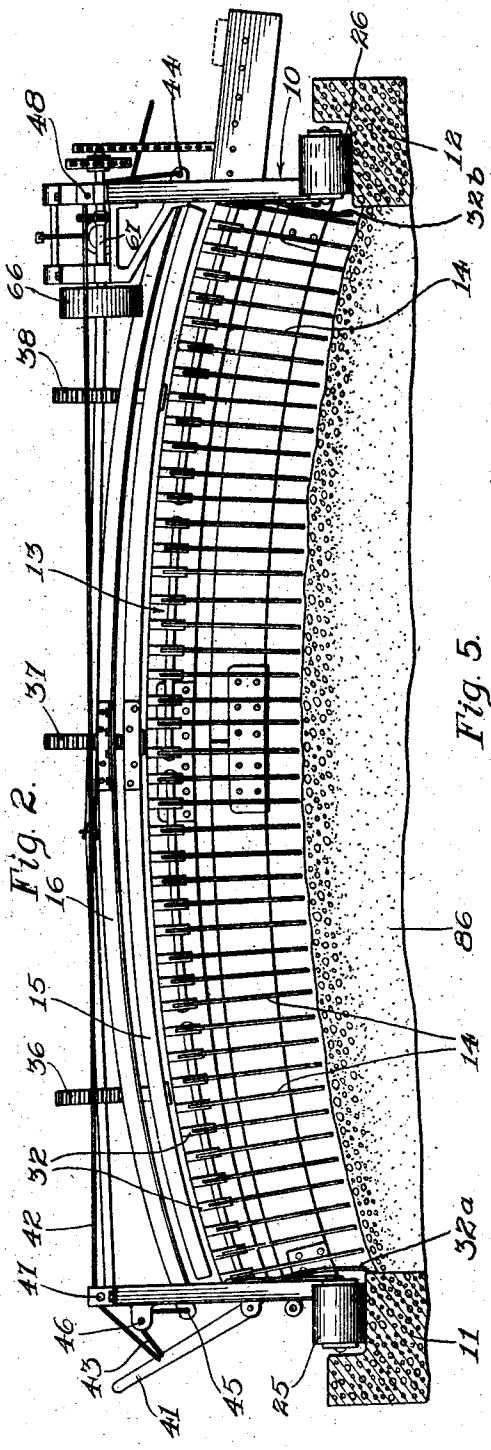


Fig. 2.

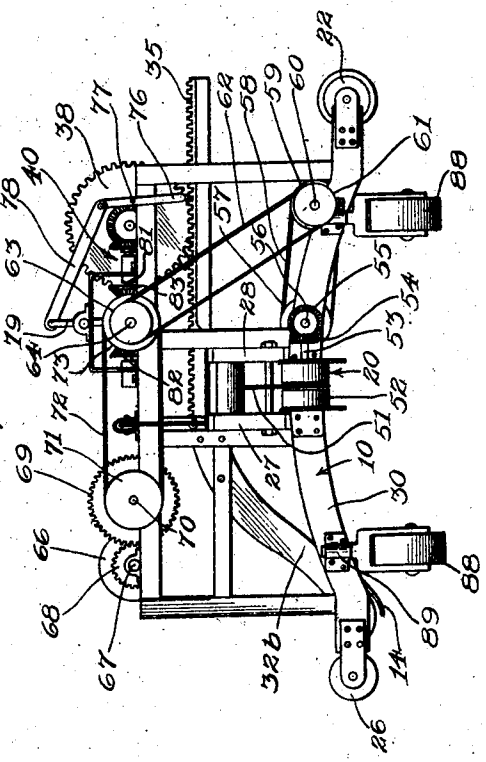


Fig. 5.

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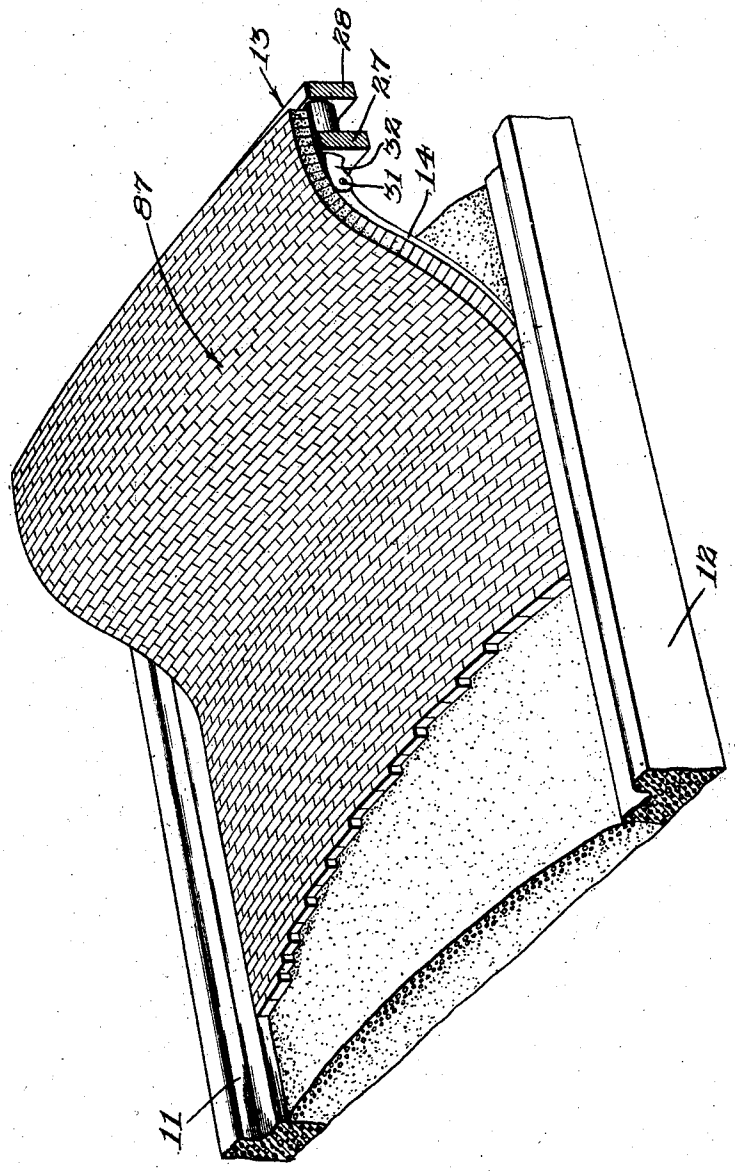


Fig. 3.

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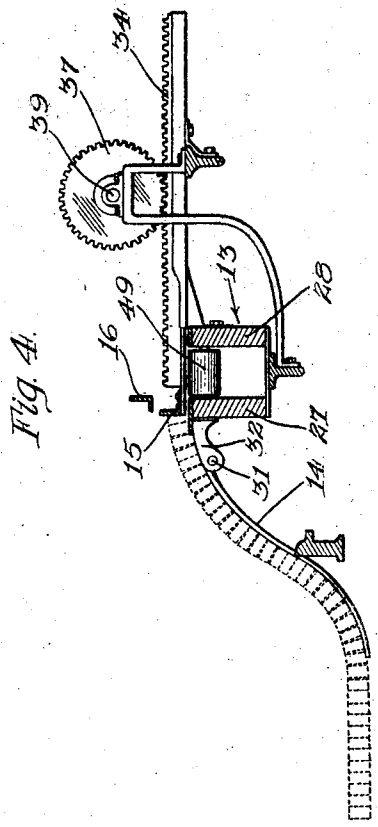


Fig. 4.

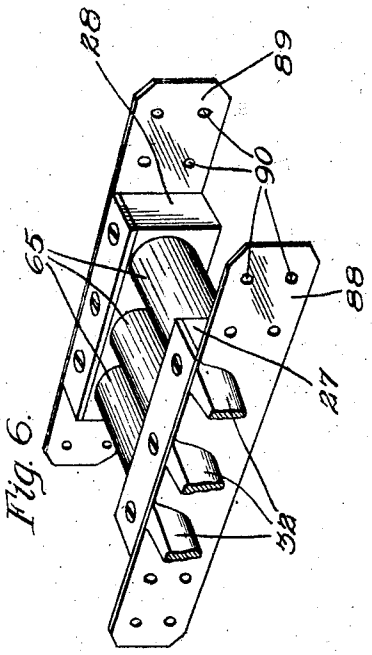


Fig. 6.

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Patented Mar. 3, 1925. 1,527,983

UNITED STATES PATENT OFFICE.

KNUT A. LUNDSTROM, OF SENECA, ILLINOIS.

PAVING MACHINE.

Application filed September 18, 1922. Serial No. 588,745.

To all whom it may concern:

Be it known that I, KNUT A. LUNDSTROM, a citizen of the United States, residing at Seneca, in the State of Illinois, have invented new and useful Improvements in Paving Machines, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to paving machines. One of the objects of my invention is to provide a paving machine which will lay the pavement quickly with a minimum of manual labor.

A further object of my invention is to provide a machine which will lay a whole row of paving blocks or bricks at a time.

A further object of my invention is to provide a paving machine which will lay a whole row of bricks at a time and press the row of bricks snugly against the pavement already laid.

A further object of my invention is to provide a paving machine which is advanced by the act of pressing the bricks to be laid against those already laid.

A further object of my invention is to provide a paving machine in which the bricks to be laid are carried on a floating support.

A further object of my invention is to provide a paving machine having means to support a layer of bricks and means for withdrawing this support from underneath the layer of bricks.

A further object of my invention is to provide a paving machine having means for supporting a layer of bricks, with means whereby the support may be withdrawn from underneath the layer of bricks and the paving machine simultaneously advanced.

Further objects will appear from the detailed description to follow and from the appended claims.

In the drawings, in which an embodiment of my invention is shown, Fig. 1 is a plan view of the paving machine extending from curb to curb;

Fig. 2 is a rear elevation of the machine, showing the curb and road-bed in section;

Fig. 3 is a perspective view showing the layer of bricks resting on the inclined floating support;

Fig. 4 is a section on the line 4—4 of Fig. 1;

Fig. 5 is an end view showing the machine mounted for transportation; and

Fig. 6 is a perspective view of a detail of the bridge and conveyor.

Referring now to the drawings in detail, the paving machine shown therein comprises a carriage 10 mounted to travel on the curbs 11 and 12, and having an arched bridge 13 extending from one side of the street to the other, for supporting a row of paving blocks or bricks, a series of pivotally mounted rearwardly extending inclined floating fingers 14, (pivoted at one end on the bridge 13, and having the other end floatably resting on the road-bed) for supporting a layer of bricks extending from the bridge 13 to the road-bed, a reciprocable transversely extending arched pusher-bar 15, for engaging the row of bricks on the bridge 13, a vertically reciprocable guide-bar 16, (which together with the pusher-bar 15 forms a channel for the paving blocks or bricks as they are fed onto the bridge 13, and which when lifted permits the pusher-bar 15 to engage the row of bricks on the bridge to push the machine forward, and press the bricks to be laid firmly against the bricks already laid,) conveyor means 17, extending along one-half of the bridge 13, for conveying the bricks along this bridge 13, mechanism 18 for controlling the movement of the pusher-bar 15, mechanism 19 for controlling the movement of the vertically reciprocable guide-bar 15, and mechanism 20 for controlling the conveyor mechanism 17.

Coming now to a more detailed description of the various parts thus broadly referred to above, the carriage 10 is provided with four rollers which rest on the curbs 11 and 12, the front rollers 21 and 22 being provided with flanges 23 and 24 respectively, for engaging the inside edges of the curbs, the rear rollers 25 and 26 not being provided with flanges, but resting on top of the curbs. In explanation of the provision of flanges on the front rollers and the fact that the rear rollers do not have flanges, it is stated that the front rollers are in advance of the part of the pavement which is laid, so that there is no pavement to interfere with the flanges, while the rear rollers are in the rear of the pavement which is laid, and this pavement might interfere with the flanges.

The transversely extending arched bridge comprises a pair of arched beams 27 and 28 extending between the end trucks 29 and 30 on which the rollers 22, 23, 25, and 26 are

mounted, these beams 27 and 28 are serving as a support for the conveying mechanism 17 which lies therebetween.

The series of pivoted floating fingers 14 which together form a floating support for a layer of the bricks, are pivotally mounted at 31 on brackets 32 secured to the rear of the beam 27.

In order to guide the layer of bricks and properly position them laterally, I provide a pair of spring guides 32^a and 32^b respectively, the tension in the spring guide 32^a being such as to cause it to bear against the adjacent curb, so that the bricks will be guided to lie snugly against the curb, the tension in the spring finger 32 being such as to bear on the adjacent edge of the layer of bricks and tend them to force the layer of bricks over towards the curb on the opposite side of the street. Thus the layer of bricks will engage one curb snugly and any space between the layer of bricks and the curb on the opposite side may be filled in by hand as the machine has done its work.

The mechanism 18 for controlling the pusher-bar 15 comprises a plurality of racks, 33, 34, and 35, to which the pusher-bar 15 is secured, a plurality of pinions, 36, 37 and 38, meshing with the racks respectively, a common shaft 39 upon which the pinions 36, 37 and 38 are mounted, and manually controllable mechanism 40 whereby the shaft 39 may be caused to rotate in one direction or the other at will.

The pusher-bar 15 can thus be caused to move back and forth as desired.

The manually controllable mechanism 19 for controlling the raising and lowering of the guide-bar 16 comprises a hand-lever 41 and a pair of cables 42 and 43, connected at 44 and 45 respectively to the ends of the guide-bar 16, suitable pulleys being provided at 46, 47 and 48, to guide the cables 42 and 43. Referring to Fig. 2 it will be seen that moving the lever 41 left will raise the guide-bar 16, while moving it to the right will permit it to lower under the influence of gravity.

The conveyor-mechanism 17 for advancing the bricks between the pusher-bar 15 and the guide-bar 16 comprises a series of rollers 49 having circumferential grooves 50, and an endless cable or belt 51, the upper run of which lies in the grooves 50 of the rollers 49.

The mechanism 20 for actuating this conveyor-cable 51, comprises a grooved drive pulley 52, (Fig. 5) a shaft 53 on which the pulley 52 is mounted, a bevel-gear 54 mounted on the shaft 53, a bevel-gear 55 meshing with the bevel-gear 54, a shaft 56 on which the bevel-gear 55 is mounted, a sprocket 57 mounted on the shaft 56, a sprocket chain 58 running over the sprocket 57, a sprocket 59 driving the sprocket chain 58, a shaft 60 on which the sprocket 59 is mounted, a sprocket 61 mounted on the shaft 60, and a sprocket chain 62 running over the sprocket 61 and driven from the sprocket 63 mounted on the shaft 64 hereinafter referred to. As the pulley 52 drives the cable 51, the cable 51 lying in the grooves 50 of the rollers 49 causes these rollers to revolve, and the cable 51 acting with the rollers 49 causes the bricks to be advanced toward the middle of the bridge.

It will be noted that the cable 51 extends only to the middle of the bridge. There is no necessity for extending it farther, as the bridge begins to slope downwardly from the middle and the bricks resting on the anti-friction rollers 65 are simply pushed along by the bricks resting on the driven rollers 49, the bricks resting on the anti-friction rollers 65 being assisted in their movement by gravity.

Suitable mechanism is provided for driving the shaft 18 which controls the reciprocation of the push-bar 15, comprising a drive-pulley 66, a shaft 67 on which the pulley 66 is mounted, a pinion 68 mounted on the shaft 67, a gear 69 meshing with the pinion 68, a shaft 70 on which the gear 69 is mounted, a sprocket 71 mounted on the shaft 70, a sprocket chain 72 running over the sprocket 71, a sprocket 73 driven from the sprocket chain 72, the shaft 64 hereinbefore referred to, on which the sprocket 73 is mounted, a bevel-gear 75 mounted on the shaft 64 and the manually controllable mechanism 40 hereinbefore referred to for controlling the direction of rotation of the shaft 18 at will.

The reversing mechanism 40 comprises a hand-lever 76, pivoted at 77, a link 78, pivoted to the hand-lever 76, a lever 79 pivotally connected with the link 78, a clutch-sleeve 80 movable back and forth by means of the lever 79, a shaft 81 on which the clutch-sleeve 80 is splined, oppositely rotating beveled pinions 82 and 83, loosely mounted on the shaft 81, and both meshing with the bevel-gear 75, a bevel-gear 84 mounted on the shaft 81, and a bevel-gear 85 on the shaft 39 and meshing with the bevel-gear 84.

The above described transmission between the pulley 66 and the shaft 39 which controls the pusher-bar 15, is provided simply for the purpose of enabling the shaft 13 to be driven in either direction at will, whenever desired, and any other transmissions which will accomplish the purpose equally as well may be substituted.

The use and operation of the paving machine is as follows:

Assuming that the curbs 11 and 12 and the road-bed 86 have been prepared ready for the paving blocks or bricks, the machine is placed in position with the rollers 21,

22, 25, and 26, resting on the curb, and with the ends of the floating fingers 14 resting on the road-bed, a layer of paving blocks or bricks is placed on the floating platform formed by the floating fingers 14, (either directly by hand or by the use of the conveyor mechanism 17 and pusher-bar 15). Assuming then, that the floating platform formed by the floating fingers 14 is covered with a layer of bricks, the conveyor mechanism 17 is then put in motion and bricks are fed by hand to the conveyor mechanism 17, the bricks being fed in at the right hand of the machine as shown in Figs. 1 and 2. The bricks are carried to the left as shown in Figs. 1 and 2 by means of the conveyor mechanism 17, until a row of bricks is formed extending completely across the bridge, the bricks being pushed along after they leave the driven rollers 49 by means of the bricks which are resting on these rollers.

As soon as a row of bricks extending across the bridge has been formed between the guide-bar 16 and the pusher-bar 15, the conveyor mechanism 17 is thrown out of gear by means of a suitable clutch (not shown). The guide-bar 16 is then lifted by moving the hand-lever 41 to the left as shown in Fig. 2, this guide-bar being thus raised to the position shown in Fig. 4. This gets the guide-bar 16 out of the way of the row of bricks so that the pusher-bar 15 can be operated. The hand-lever 76 which controls the operation of the pusher-bar 15 is then moved to a position to cause the shaft 39 and pinions 37 to rotate in a direction which will tend to move the racks and pusher-bar 15 rearward. This causes the pusher-bar 15 to bear on the bridge 13, and this pressure reacts on the machine, to shove the machine forward, at the same time pushing the layer of bricks 87 resting on the floating platform snugly together and forcing the bricks which are at the extreme rear ends of the floating fingers 14 snugly against the bricks which are already laid.

When the machine has been pushed ahead a distance equal to the thickness of the row of bricks, the lever 76 is shifted to reverse the direction of rotation of the shaft 39, causing the racks and pusher-bar 15 to be moved ahead, out of the way of the guide-bar 16. When the racks 34 and pusher-bar 15 have been moved far enough ahead to get them out of the way of another row of bricks, the lever 76 is moved into neutral position and the shaft 39, racks and pusher-bar 15 come to rest.

This cycle of operation described is then repeated, another row of bricks being fed onto the bridge by means of the conveying mechanism 17, the guide-bar 16 being then lifted away, and the pusher-bar 15 shoved rearwardly to feed the machine ahead and withdraw the floating platform 14 out from underneath the rear layer of bricks resting on it and jam this rear layer of bricks snugly against the bricks already laid.

In order to readily transport the machine from one place to another, I may provide a set of caster wheels 88 which may be readily attachable and detachable with respect to the pockets 89 in which they are swiveled. If desired, I may also provide a readily attachable and detachable tongue or draft connection 90 for use in hauling the machine from one place to another.

In order that the machine may be made adjustable for paving streets of different widths, I may provide insertable sections as shown in Fig. 6, whereby the bridge, conveyor, and the floatable support may be lengthened out. To accommodate this insertable section, the bridge itself may be made in sections, separable at any suitable point, (for instance, at the middle of the bridge). When it is desired to lengthen out the bridge for a wider street, the bridge may be disconnected at the middle and the section shown in Fig. 6 inserted. This section will be provided with the finger-supporting brackets 32 for supporting the floatable fingers 14, and will carry a set of conveyor rollers 65, between the beam sections 27 and 28.

Any suitable means may be provided for connecting the sections together, such as connecting plates 88 and 89 provided with bolt-holes 90, through which bolts may be inserted for securing the adjacent bridge sections together.

It will thus be seen that I have devised an improved paving machine which requires a minimum of manual labor, in which the pavement can be quickly laid, and in which the paving bricks or blocks will be pressed firmly together as they are laid.

While I have shown but one embodiment of my invention, it is obvious that it may be embodied in other forms covered and defined by the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patents of the United States is:

1. A paving machine comprising a carriage movable longitudinally of the street to be paved, a bridge supported on said carriage extending transversely of the street, for supporting a row of paving blocks or bricks, rearwardly extending supporting means leading from said bridge to the roadbed, for supporting a layer of bricks between the bridge and the pavement already laid, a pusher extending along said bridge in front of the row of bricks for engaging and pressing on the row of bricks to withdraw said supporting means from underneath the row of bricks on the rear end of the supporting means, whereby this row

of bricks is pressed snugly against the pavement already laid, and a guide bar co-operating with said pusher-bar to form a channel for the row of bricks on the bridge, said guide bar being movable from a position in which it acts as a guide for the bricks to a position in which it is out of the way of the bricks as they are acted on by the pusher bar.

2. A paving machine comprising a carriage movable longitudinally of the street to be paved, floating means for supporting a layer of paving blocks or bricks pivotally mounted at its front end on said carriage, and with its rear end floatably resting on the road-bed said layer extending transversely of the street.

3. A paving machine comprising a carriage movable longitudinally of the street to be paved, means for supporting a layer of paving blocks or bricks on said carriage, said layer extending transversely of the street, said supporting means comprising a plurality of fingers having their ends floatably resting on the road-bed.

4. A paving machine comprising a carriage movable longitudinally of the street to be paved, rearwardly extending floating means for supporting a layer of paving blocks or bricks pivotally mounted at its front end on said carriage, said layer extending transversely of the street, and means for moving said supporting means from underneath said layer of bricks.

In witness whereof, I have hereunto subscribed my name.

KNUT A. LUNDSTROM.