Nov. 24, 1931. R. W. BRIGGS 1,833,387

ROAD FINISHING MACHINE

Filed Sept. 9, 1930 4 Sheets-Sheet 1

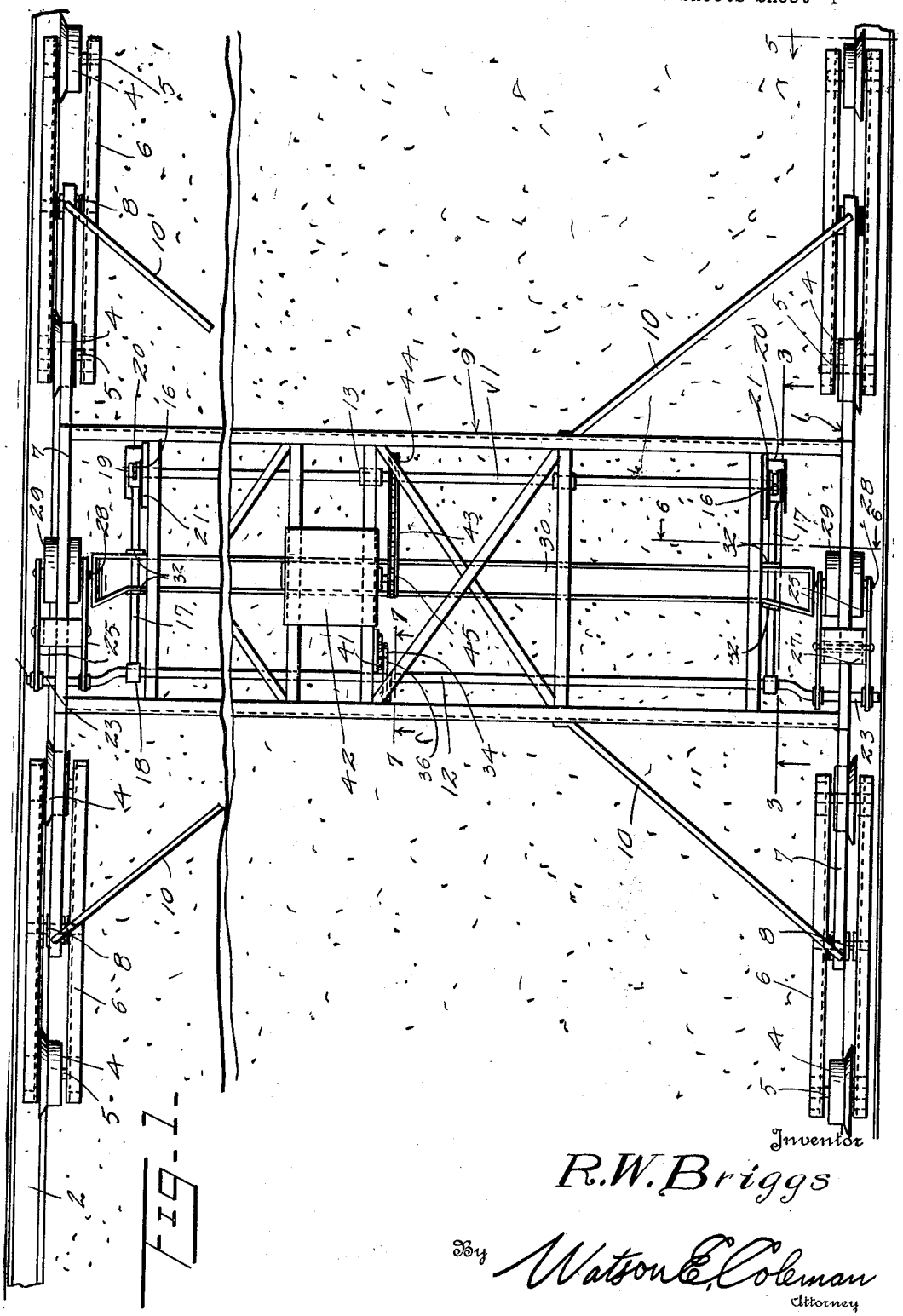


Fig. 1.

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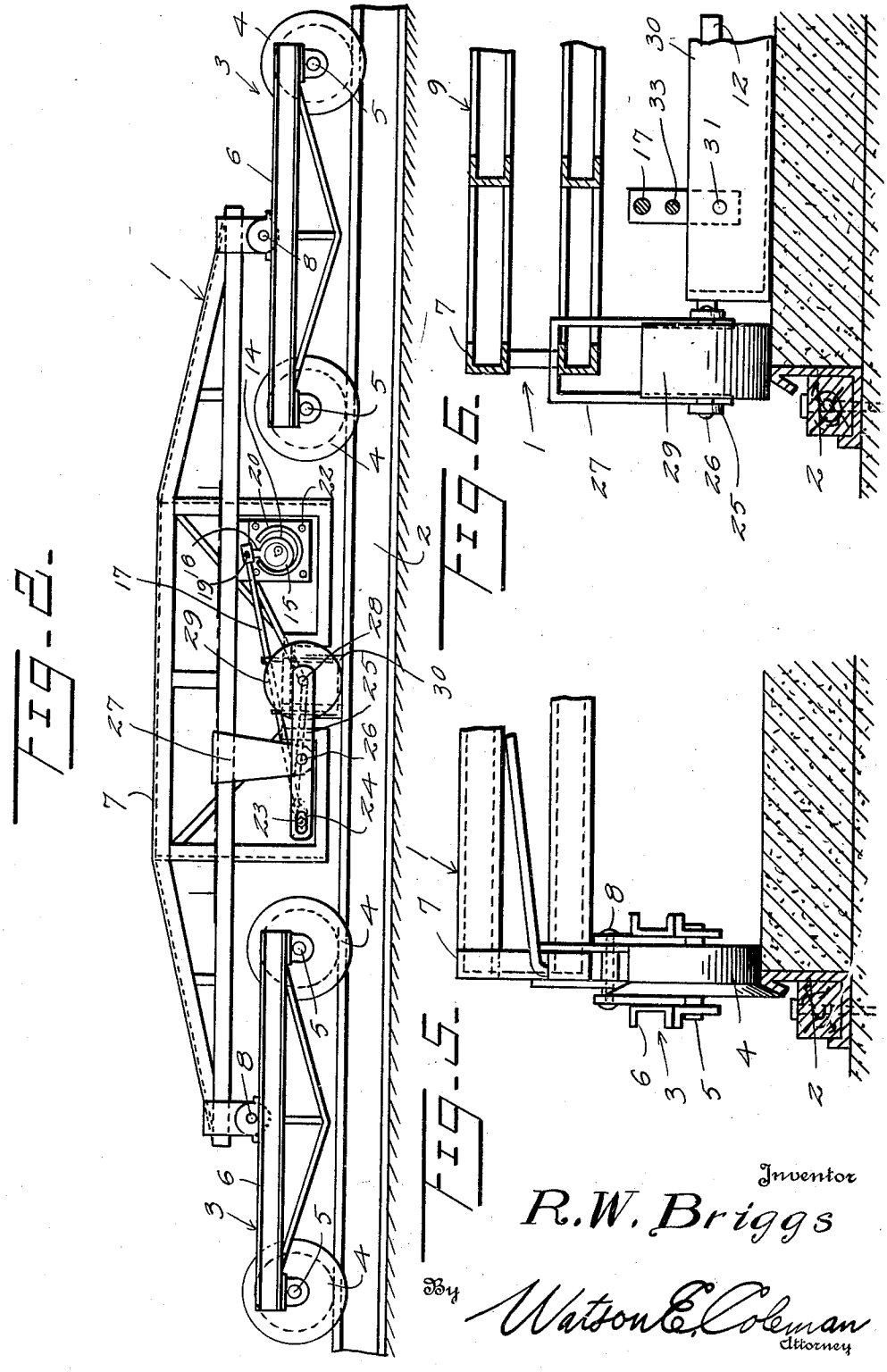


Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

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ROAD FINISHING MACHINE

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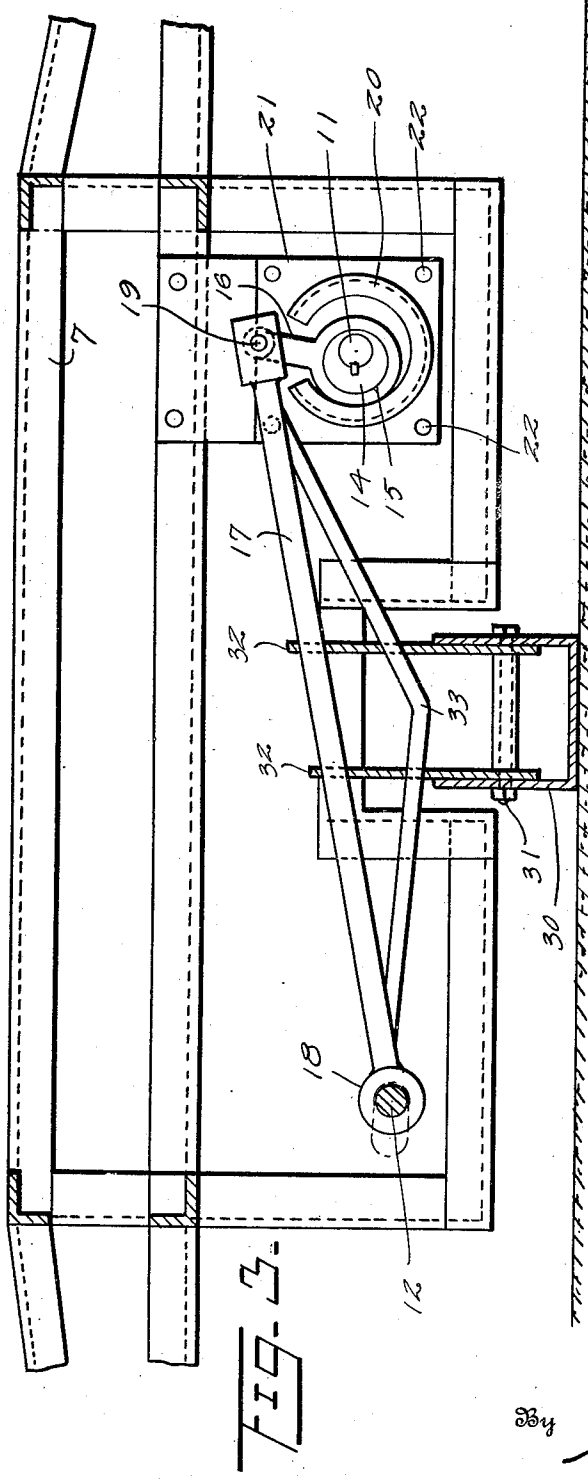


Fig. 3.

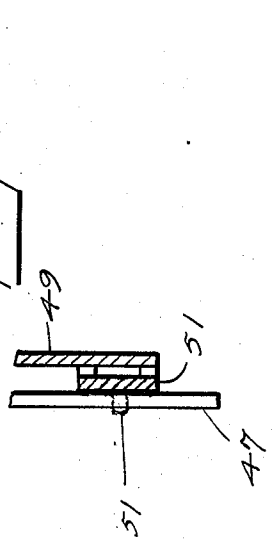


Fig. 5.

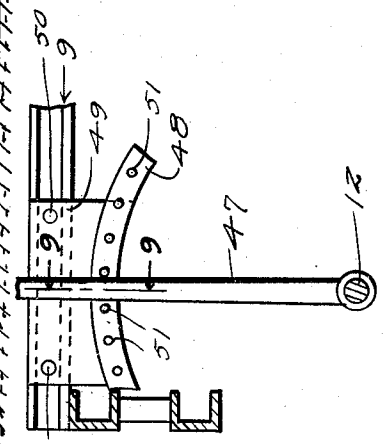


Fig. 4.

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ROAD FINISHING MACHINE

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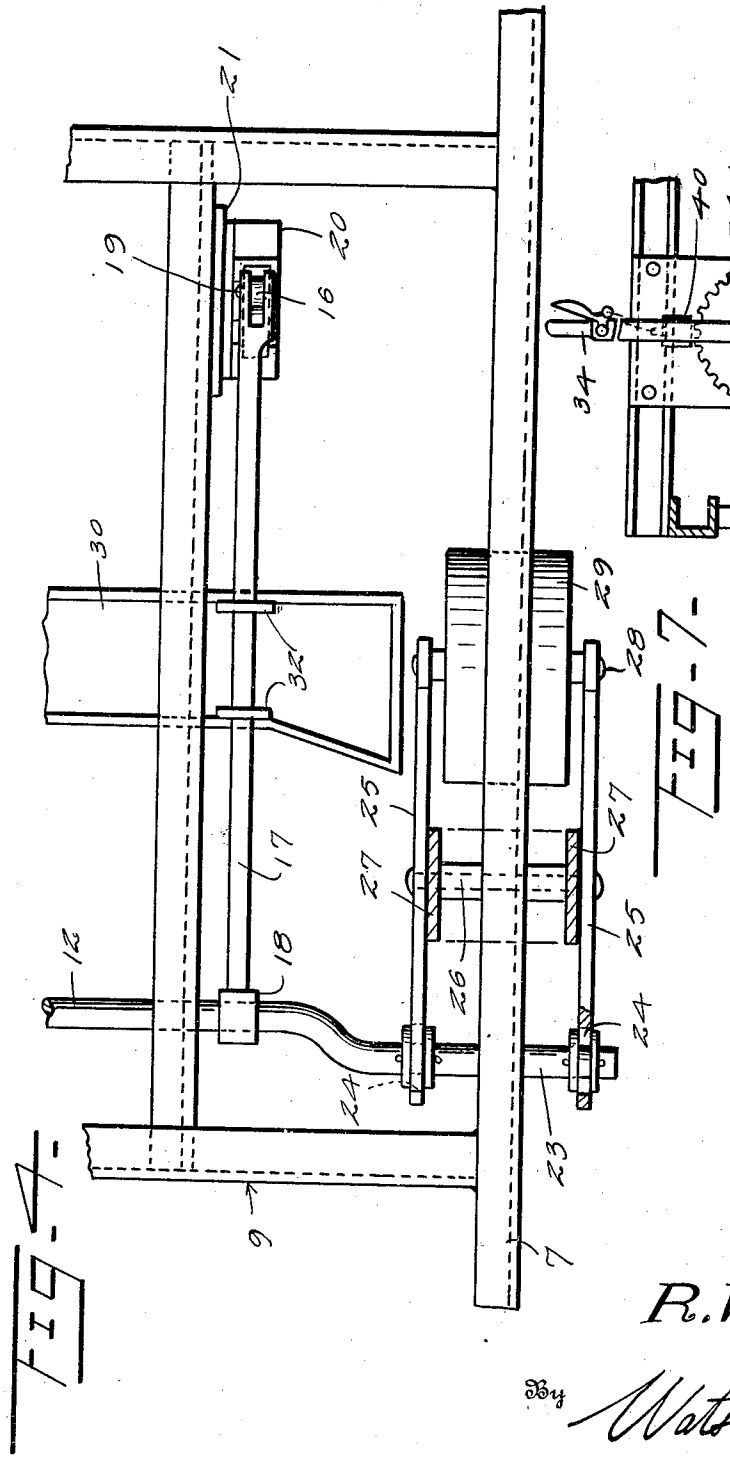


FIG. 7.

FIG. 4.

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UNITED STATES PATENT OFFICE

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ROAD FINISHING MACHINE

Application filed September 9, 1930. Serial No. 480,771.

This invention relates to a road finishing machine, and more particularly to a machine adapted to strike off and smooth concrete, asphalt or other paving material laid between forms located at the sides and extending longitudinally of a road.

The invention has for one of its objects to provide a machine of the character stated which shall embody a carriage adapted to be mounted upon and travel along the forms, and a screed supported solely by the carriage and governed thereby in a manner to automatically smooth out all the irregularities in the paving material.

The invention has for a further object to provide a machine of the character stated wherein the screed shall be mounted on the carriage for vertical adjustment with respect to the paving material, and which shall embody screed adjusting means adapted to be controlled by the forms to effect the raising of the screed when low places in the forms are encountered and to effect the lowering of the screed when high places in the forms are encountered, to the end that low places in the paving material may be filled and high places therein smoothed off.

The invention has for a further object to provide a machine of the character stated which shall embody means adapted to maintain the screed in a constant state of vibration, to the end that the screed may be moved smoothly and evenly over the paving material.

With the foregoing and other objects in view, the nature of which will appear as the description proceeds, the invention consists in the construction, combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawings, wherein:—

Figure 1 is a top plan view of a road finishing machine constructed in accordance with my invention;

Figure 2 is a view in side elevation of the machine;

Figure 3 is a sectional view on an enlarged scale taken on the vertical plane indicated by the line 3—3 of Figure 1;

Figure 4 is a sectional view on an enlarged scale taken on the horizontal plane indicated by the line 4—4 of Figure 2;

Figure 5 is a sectional view on an enlarged scale taken on the vertical plane indicated by the line 5—5 of Figure 1;

Figure 6 is a sectional view on an enlarged scale taken on the vertical plane indicated by the line 6—6 of Figure 1;

Figure 7 is a sectional view on an enlarged scale taken on the vertical plane indicated by the line 7—7 of Figure 1;

Figure 8 is a view similar to Figure 7 illustrating a slightly modified form of the means for setting the screed, and

Figure 9 is a sectional view taken on the vertical plane indicated by the line 9—9 of Figure 8.

The machine comprises a carriage 1 which is adapted to be mounted upon and travel along the forms, designated 2, between which concrete and the like paving material is laid. The carriage 1 comprises four similar trucks 3 two of which are mounted in longitudinally spaced relation upon one of the forms 2 and the other two of which are similarly mounted upon the other form. Each of the trucks 3 comprises a pair of wheels 4 having flanges contacting with the outer sides of the forms 2, axles 5, and beams 6 supported at their ends on the axles. The beams 6 are arranged in parallel relation to the forms 2, and beams 7 located above and arranged in parallel relation to the beams 6 are pivotally connected at their ends, as at 8, to the transverse centers of the trucks 3. The beams 7 connect the trucks 3, and maintain the trucks of each pair in proper spaced relation. The pivots 8 connecting the beams 7 to the beams 6, extend horizontally and transversely of the trucks 3 to permit the trucks to move independently and thus follow any irregularities in the forms 2. A frame 9 located between the beams 7 is secured to the beams centrally between the ends of the latter, and braces 10 extend from the ends of the beam to the sides of the frame 9.

Shafts 11 and 12 extend longitudinally of the frame 9 at opposite sides of the longitudinal center of the frame, the shaft 11 being journaled in bearings 13 carried by the

frame, and the shaft 12 being free for vertical movement with respect to the frame. Eccentrics 14 are fixed to the ends of the shaft 11, and the straps 15 of the eccentrics are provided with upwardly extending arms 16.

Rods 17 arranged transversely of the frame 9, extend from the shaft 12 to the arms 16. The rods 17 are provided with bearings 18 for the shaft 12, and are pivotally connected, as at 19, to the arms 16. The rocking movement of the eccentric straps 15 and their arms 16 is limited by arcuate stops 20 which are carried by plates 21 fixed, as at 22, to the frame 9. The stops 20 surround the eccentric straps 15, and the arms 16 of the eccentric straps are arranged between the ends of the stops and cooperate therewith to limit the rocking movement of the eccentric straps and arms.

The shaft 12 has its terminal portions offset radially to provide cranks 23 which are loosely arranged in slots 24 formed in the ends of equalizing bars or levers 25 which extend from the cranks in the general direction of the shaft 11. The levers 25 are arranged in pairs, and the levers of each pair are pivoted centrally between their ends, as at 26, to the lower ends of brackets 27, extending downwardly from the beams 9. The brackets 27 are located in a plane located between the longitudinal center of the carriage 1 and the shaft 12. Axles 28 are carried by the other ends of the levers 25, and journaled thereon are balance wheels 29 adapted to rest upon and travel along the forms 2.

A screed 30 located in the longitudinal center of the carriage 1 is secured, as at 31, to the lower ends of arms 32 extending downwardly from the rods 17 which are reinforced by braces 33. An upright hand lever 34 is pivoted at its lower end, as at 35, to the frame 9, and is provided at its lower end with an arm 36.

An arm 37 connected to the shaft 12, as at 38, is connected to the arm 36 by a link 39. The lever 34 is provided with a latch 40 engaging a notched sector 41 secured to the frame 9. As its cranks 23 are journaled in the levers 25, the shaft 12 is supported by levers for rocking movement toward and away from the paving material, and as the screed supporting rods 17 are pivoted to the eccentric strap arms 16 and connected to the shaft, the rocking of the shaft in the direction of the paving material lowers the screed 30 and the rocking of the shaft away from the paving material raises the screed. The shaft 12 is adapted to be rocked through the medium of the lever 34, and it is adapted to be secured in the position into which it is rocked by the latch 40 and notched sector 41. It will thus be seen that the screed 30 may be adjusted into the proper position with respect to the paving material and secured in such position. The screed 30 is adapted to be moved from this, its normal position, by the balance wheels 29 during the passing of the balance wheels over low or high places in the forms 2, and the screed is adapted to be maintained in this position by the balance wheels while they are passing over level portions of the forms. During the passing of the balance wheels 29 over low places in the forms 2, the levers 25 are rocked in a direction to raise the shaft 12 and with it the screed 30, with the result that the paving material accumulated in front of the screed will drop into low places in the paving material. During the passage of the balance wheels 29 over high places in the forms 2, the levers 25 will be rocked in a direction to lower the shaft 12 and with it the screen 30, with the result that high places in the paving material will be struck off.

A power plant 42, which may consist of an internal combustion engine or the like is mounted upon the frame 9. The shaft 11 is driven at high speed from the power plant 42 through the medium of a sprocket chain 43 passing about a sprocket wheel 44 fixed to the shaft and a sprocket wheel 45 fixed to the driving shaft 46 of the power plant.

As the screed supporting rods 17 are connected to the shaft 11 through the medium of the eccentrics 14, the screed 30 will be rapidly vibrated, with the result that it may be moved smoothly and evenly over the paving material.

The modified form of the means for setting the screed 30, shown in Figures 8 and 9, comprises an upright lever 47 fixed at its lower end to the shaft 12, an arcuate bar 48 carried by a plate 49 fixed, as at 50, to the frame 9, and pins 51 extending laterally from the bar. The lever 47 is adapted, after the setting of the screed 30, to be arranged between a pair of the pins 51, and it is movable vertically with respect to the pins to enable the balance wheels 29 to raise and lower the screed from its set position.

From the foregoing description, taken in connection with the accompanying drawings, it will be understood that the screed 30 may be set to strike off the desired amount of the surface of the paving material, that the screed is maintained in its set or normal position while the balance wheels 29 are passing over level stretches of the forms 2, and that the screed will be raised when the balance wheels encounter low places in the forms and lowered when they encounter high places in the forms, with the result that a uniform and smooth surface is imparted to the paving material. The position of the pivot 26 of each equalizing bar or lever 25 with respect to the pivots 8 of the adjacent trucks, is such that the motion of the screed 30 upwardly and downwardly will be the correct amount to take out

any irregularities in the surface of the paving material.

While I have described the principle of the invention, together with the structure which I now consider the preferred embodiment thereof, it is to be understood that the structure shown is merely illustrative and that such changes may be made, when desired, as fall within the scope of the invention as claimed.

I claim:—

1. A machine for finishing the surface of paving material laid between forms, comprising a carriage adapted to be mounted upon the forms for movement in the direction of the length thereof, a screed, means supporting the screed from the carriage and operable to set the screed and to raise or lower it from set position, and elements forming a part of said means and contacting with the forms to hold said means against operation while they are traveling over level portions of the forms, to operate said means to effect the raising of the screed while they are traveling over low portions of the forms, and to operate said means to effect the lowering of the screed while they are traveling over raised portions of the forms.

2. A machine for finishing the surface of paving material laid between forms, comprising a carriage adapted to be mounted upon the forms for movement in the direction of the length thereof, a screed, means supporting the screed from the carriage and operable to set the screed and to raise or lower it from set position, manually controlled means for operating said first means to effect the setting of the screed, and elements forming a part of said means and contacting with the forms to hold said means against operation while they are traveling over level portions of the forms, to operate said means to effect the raising of the screed while they are traveling over low portions of the forms, and to operate said means to effect the lowering of the screed while they are traveling over raised portions of the forms.

3. A machine for finishing the surface of paving material laid between forms, comprising a carriage adapted to be mounted upon the forms for movement in the direction of the length thereof, a screed, means supporting the screed from the carriage and operable to set the screed and to raise or lower it from set position, elements forming a part of said means and contacting with the forms to hold said means against operation while they are traveling over level portions of the forms, to operate said means to effect the raising of the screed while they are traveling over low portions of the forms, and to operate said means to effect the lowering of the screed while they are traveling over raised portions of the forms, and means for operating said first means to effect the vibration of the screed.

4. A machine for finishing the surface of paving material laid between forms, comprising a carriage adapted to be mounted upon the forms for movement in the direction of the length thereof, a screed, means supporting the screed from the carriage and operable to set the screed and to raise or lower it from set position, manually controlled means for operating said first means to effect the setting of the screed, elements forming a part of said means and contacting with the forms to hold said means against operation while they are traveling over level portions of the forms, to operate said means to effect the raising of the screed while they are traveling over low portions of the forms, and to operate said means to effect the lowering of the screed while they are traveling over raised portions of the forms, and means for operating said first means to effect the vibration of the screed.

5. A machine for finishing the surface of paving material laid between forms, comprising pairs of trucks, each pair of trucks being adapted to be mounted upon each form for movement in the direction of the length thereof, a frame mounted upon and pivotally connected to the trucks, a screed, means supporting the screed from the frame and operable to set the screed and to raise or lower it from set position, and elements forming a part of said means and contacting with the forms to hold said means against operation while they are traveling over level portions of the forms, to operate said means to effect the raising of the screed while they are traveling over low portions of the forms, and to operate said means to effect the lowering of the screed while they are traveling over raised portions of the forms.

6. A machine for finishing the surface of paving material laid between forms, comprising a carriage adapted to be mounted upon the forms for movement in the direction of the length thereof, a shaft journaled on the carriage and extending transversely of the paving material, means for rotating the shaft, eccentrics fixed to the shaft and provided with straps, rods extending longitudinally of the paving material and pivotally connected at certain ends thereof to the eccentric straps, a shaft extending transversely of the paving material and journaled in the other ends of the rods and terminally provided with cranks, levers pivoted intermediate their ends to the carriage and provided at certain ends thereof with openings receiving the cranks, balance wheels journaled on the other ends of the levers and adapted to travel upon the forms, and a screed suspended from the rods.

7. A machine for finishing the surface of paving material laid between forms, comprising a carriage adapted to be mounted upon

the forms for movement in the direction of the length thereof, a shaft journaled on the carriage and extending transversely of the paving material, means for rotating the shaft, eccentrics fixed to the shaft and provided with straps, rods extending longitudinally of the paving material and pivotally connected at certain ends thereof to the eccentric straps, a shaft extending transversely of the paving material and journaled in the other ends of the rods and terminally provided with cranks, levers pivoted intermediate their ends to the carriage and provided at certain ends thereof with openings receiving the cranks, balance wheels journaled on the other ends of the levers and adapted to travel upon the forms, a screed suspended from the rods, a hand lever pivoted upon the carriage and provided with an arm, a second arm connected to said second shaft and connected to said first arm, and means adapted to hold the lever against accidental movement.

8. A machine for finishing the surface of paving material laid between forms, comprising pairs of trucks, each pair of trucks being adapted to be mounted upon each form for movement in the direction of the length thereof, a frame mounted upon and pivotally secured to the trucks adapted to extend across the paving material, rods extending transversely of the frame and pivotally connected at certain ends thereof to the frame, a shaft extending longitudinally of the frame and journaled in the free ends of the rods and terminally provided with cranks, levers pivoted to the frame and extending transversely thereof and provided at certain ends thereof with openings receiving the cranks, balance wheels journaled in the other ends of the levers and adapted to travel upon the forms, and a screed suspended from the rods.

9. A machine for finishing the surface of paving material laid between forms, comprising pairs of trucks, each pair of trucks being adapted to be mounted upon each form for movement in the direction of the length thereof, a frame mounted upon and pivotally secured to the trucks adapted to extend across the paving material, rods extending transversely of the frame and pivotally connected at certain ends thereof to the frame, a shaft extending longitudinally of the frame and journaled in the free ends of the rods and terminally provided with cranks, levers pivoted to the frame and extending transversely thereof and provided at certain ends thereof with openings receiving the cranks, balance wheels journaled in the other ends of the levers and adapted to travel upon the forms, a screed suspended from the rods, and means for turning the shaft to effect the setting of the screed.

10. A machine for finishing the surface of paving material laid between forms, comprising a pair of trucks for movement longitudinally on one of the forms, a pair of trucks for movement longitudinally on the other form, the trucks on each form being movable independently and the trucks on one form being movable independently of those on the other form by irregularities in the forms, a frame connected to the trucks by horizontal pivots, and a screed supported solely from the frame.

11. A machine for finishing the surface of paving material laid between forms, comprising a pair of trucks for movement longitudinally on one of the forms, a pair of trucks for movement longitudinally on the other form, the trucks on each form being movable independently and the trucks on one form being movable independently of those on the other form by irregularities in the forms, a frame connected to the trucks by horizontal pivots, a screed, means supporting the screed from the frame and operable to effect the vibration of the screed, and means for operating said first means.

12. A machine for finishing the surface of paving material laid between forms, comprising a carriage for movement longitudinally on the forms, a screed, and means supporting the screed in set position from the carriage and operable by the forms to raise the screed at low portions of the forms and to lower the screed at raised portions of the forms.

13. A machine for finishing the surface of paving material laid between forms, comprising a pair of trucks for movement longitudinally on one of the forms, a pair of trucks for movement longitudinally on the other form, the trucks on each form being movable independently and the trucks on one form being movable independently of those on the other form by irregularities in the forms, a frame connected to the trucks by horizontal pivots, a screed, and means supporting the screed in set position from the frame and operable by the forms to raise the screed at low portions of the forms and to lower the screed at high portions of the forms.

14. A machine for finishing the surface of paving material, comprising a carriage, rods pivoted at certain ends thereof to the carriage, means connected to the other ends of the rods and operable to rock the rods, means for operating said first means, and a screed supported by the rods.

15. A machine for finishing the surface of paving material, comprising a carriage, rods pivoted at certain ends thereof to the carriage, means connected to the other ends of the rods and operable to rock the rods, means for operating said first means, a screed, and means securing the screed to the arms for adjustment with respect thereto.

In testimony whereof I hereunto affix my signature.

ROBERT W. BRIGGS.