

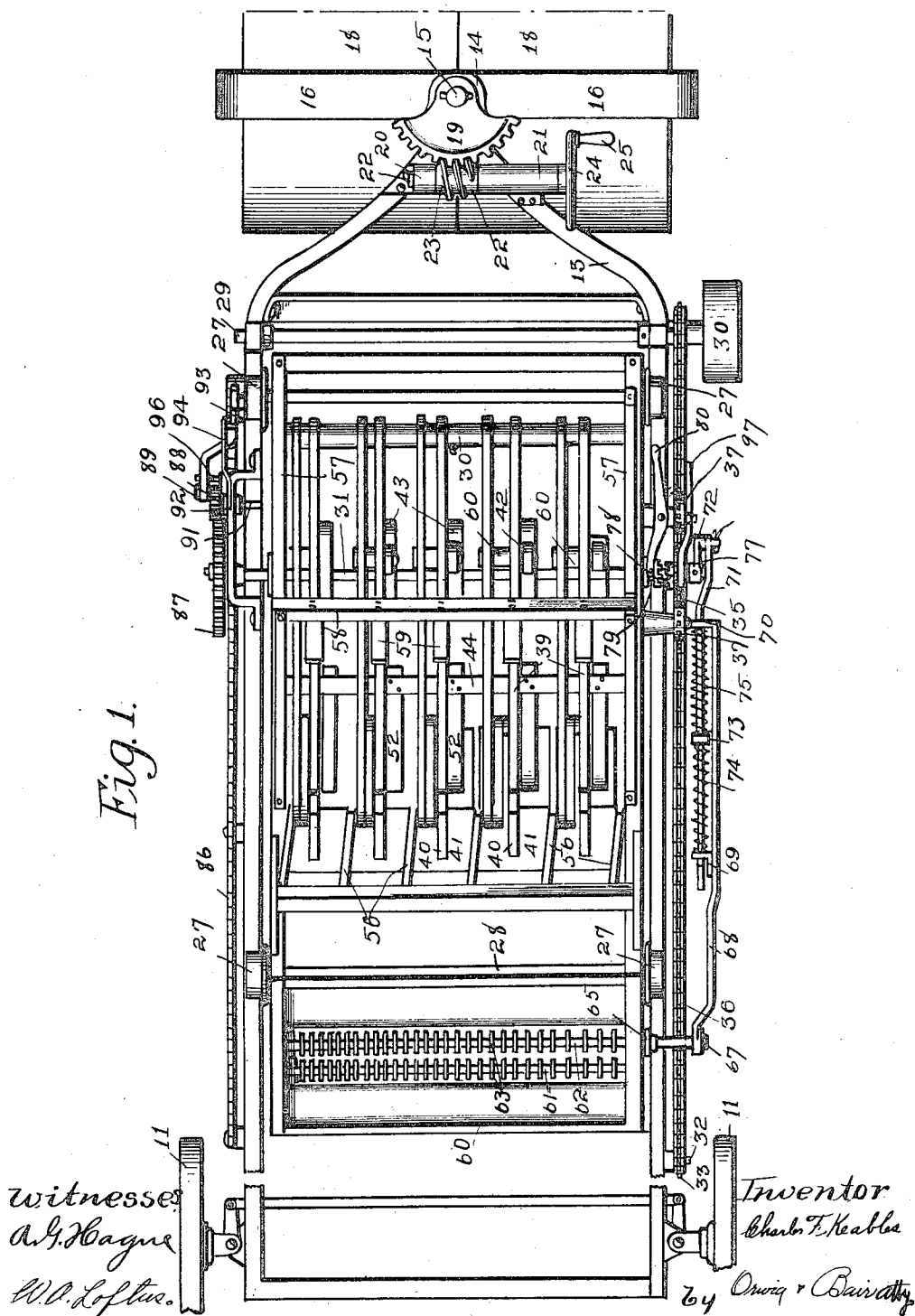
1,060,604.

C. F. KEABLES.
ROAD MAKING MACHINE.
APPLICATION FILED MAY 6, 1912.

Patented May 6, 1913.

3 SHEETS—SHEET 1.

Fig. 1.

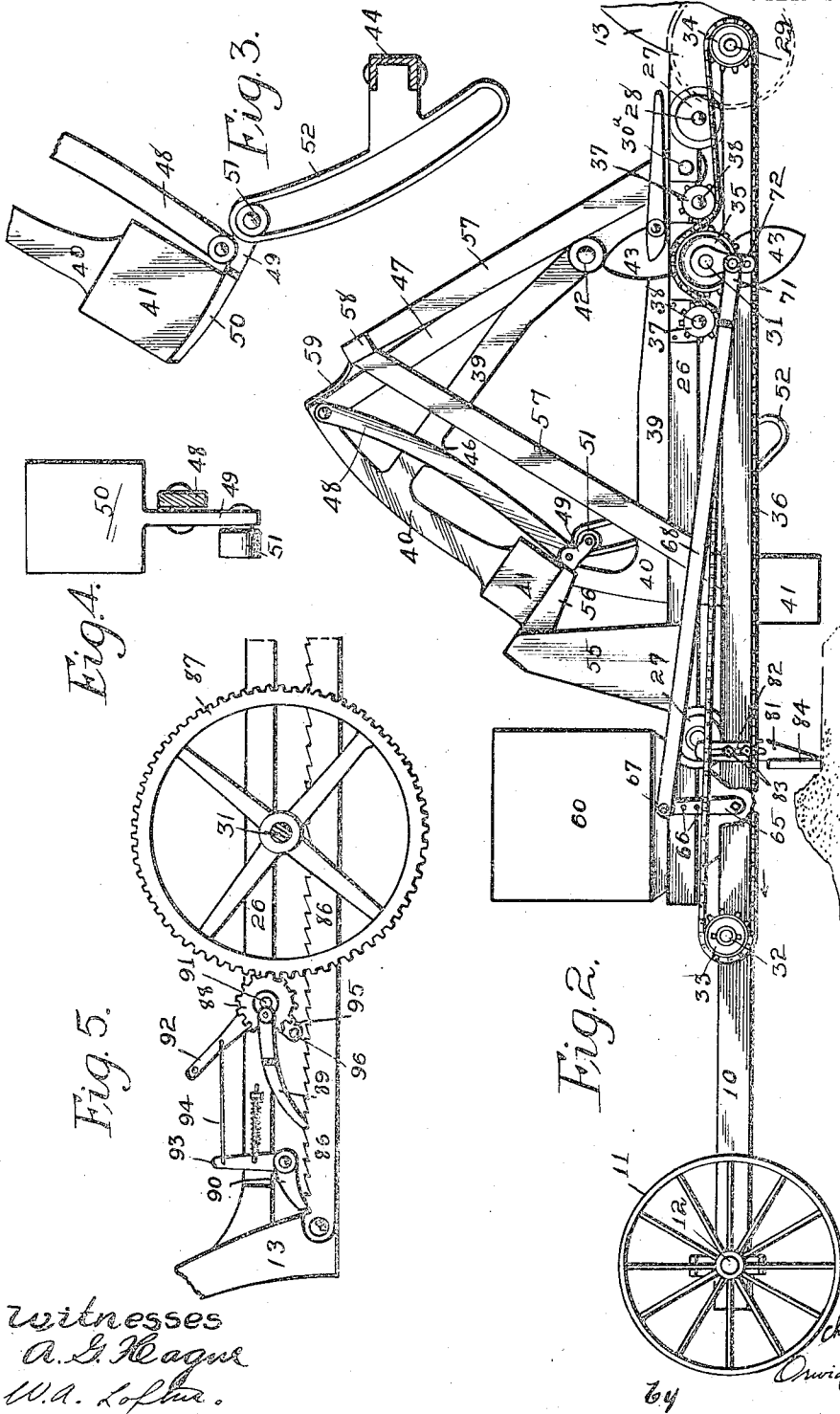


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3 SHEETS—SHEET 2.



Witnesses
A. S. Hague
W. A. Lofgren.

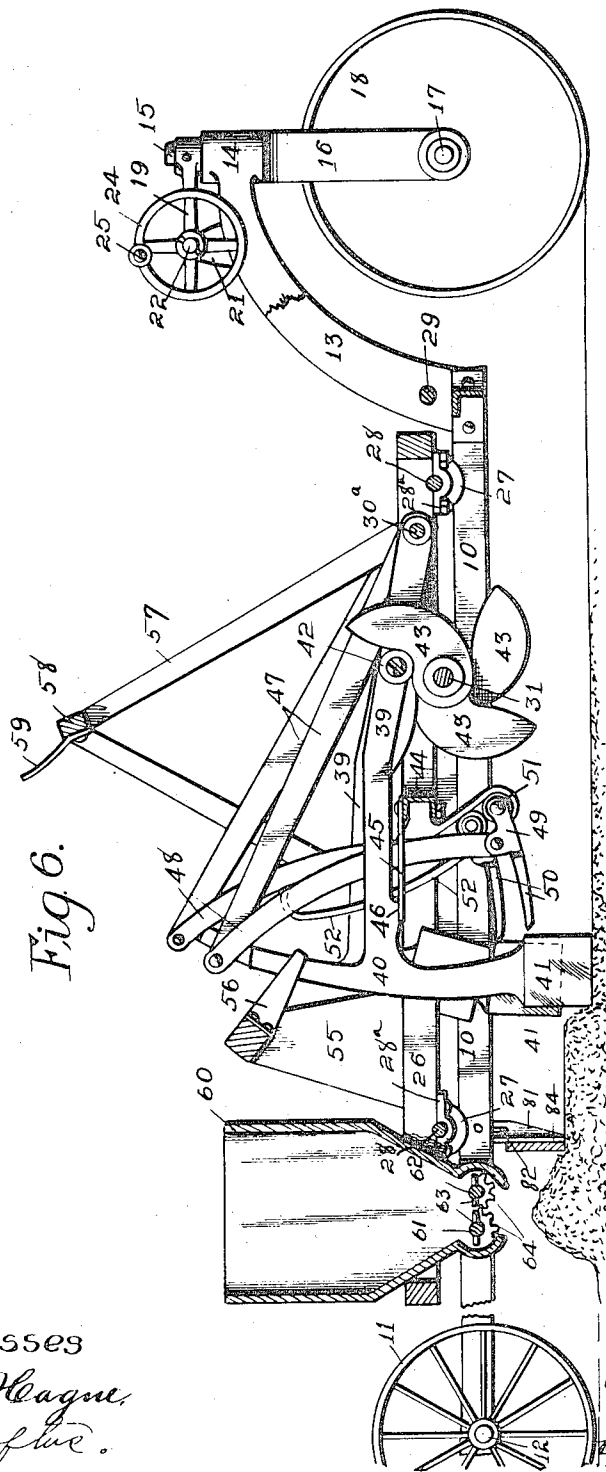
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UNITED STATES PATENT OFFICE.

CHARLES F. KEABLES, OF INDIANOLA, IOWA.

ROAD-MAKING MACHINE.

1,060,604.

Specification of Letters Patent.

Patented May 6, 1913.

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To all whom it may concern:

Be it known that I, CHARLES F. KEABLES, a citizen of the United States, residing at Indianola, in the county of Warren and State of Iowa, have invented a new and useful Road-Making Machine, of which the following is a specification.

The object of my invention is to provide a road making machine of durable construction, for tamping dirt, gravel, rock, ashes or the like, and for smoothing the surface of a road.

More particularly, it is the object of my invention to provide mechanism mounted upon a movable platform, which is, in its turn, mounted upon a platform provided with wheels or the like for transporting the machine from place to place.

A further object is to provide a road making machine having tamping weights or plungers, and having mechanism for operating those plungers alternately for tamping and smoothing the surface of a road.

A further object of my invention is to provide a machine having tamping plungers and mechanism for operating the same and provided with mechanism for cleaning the plungers after each operation.

A further object is to provide upon a movable platform, a hopper for rock, gravel or the like, in which hopper is a grate operated by suitable mechanism for discharging the contents of the hopper upon the surface of the road.

A further object is to provide means for gradually moving the movable platform forward on the stationary platform as the plungers are operated.

A further object is to provide in such a machine, a roller or pair of rollers for smoothing the road which has been tamped and to provide mechanism for steering said roller or rollers.

A further object is to provide in such a machine, means for raising the plungers slightly after each downward stroke to thereby prevent the dragging of the plungers on the ground.

My invention consists in certain detail, in the construction, arrangement and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 shows a top or plan view of an

improved road making machine, embodying my invention. Fig. 2 shows a side elevation of the same, omitting parts of the machine. Fig. 3 shows a detail view of part of the mechanism for cleaning the plungers. Fig. 4 shows a detail view of the cleaner or scraper blade. Fig. 5 shows a detail view of part of the mechanism for advancing the movable platform on the stationary platform during the operation of the machine; and Fig. 6 shows a side elevation of my improved road making machine, part of the machine being removed and part being shown in section.

In the accompanying drawings I have used the reference numeral 10 to indicate generally, the stationary frame. On the front end of the frame 10 are wheels 11 which are mounted on stub axles 12, as shown in Fig. 1. On the rear end of the frame 10 is an upwardly and rearwardly extending bracket 13, on the upper end of which is formed a bearing 14. Rotatably mounted in the bearing 14 is a shaft 15 to which are secured outwardly and downwardly extending bracket arms 16 in the lower ends of which is mounted a transverse shaft 17. Mounted on the shaft 17 are two heavy rollers 18.

For steering the rollers 18, I provide the following means: Fixed to the shaft 15 is a toothed sector 19. Mounted in suitable bearings 20 and 21 is a shaft 22 formed on which is a worm gear 23 in mesh with the teeth of the sector 19. On one end of the shaft 22 is a wheel 24 on which is a handle 25. I mount a movable frame 26 on the frame 10 by means of flanged wheels 27 which are mounted on transverse shafts 28, which in turn are rotatably mounted in suitable bearings 28^a on the frame 26. Rotatably mounted in the bracket arms 13 of the fixed frame is a transverse power shaft 29 on one end of which is a belt wheel 30 designed to be operated from any suitable source of power, as for instance, a traction engine. I shall call the end of the machine on which the rollers are mounted, the rear end thereof, and the other end, the front end.

Rotatably mounted in the frame 26, near the rear end thereof, is a transverse shaft 30^a. Rotatably mounted on the frame 26 in front of the shaft 30^a is a transverse shaft 31. Mounted on the frame 10 near the front end thereof, is a smaller idler shaft 32 on which is mounted a sprocket gear 33.

Mounted on the shaft 29 in line with the sprocket 33, is a sprocket wheel 34. Mounted on the shaft 31 in line with the sprockets 33 and 34 is a sprocket gear 35. A sprocket chain 36 travels on the sprockets 33, 34 and 35. The shaft 31 is slightly above the level of the shafts 32 and 29 and the sprocket 35 is therefore slightly above the level of the sprockets 33 and 34. On the frame 26 on each side of the sprocket 35, are mounted idler sprockets 37 on idler shafts 38. The chain 36 is designed to travel below the sprockets 38 and above the sprocket 35 as clearly shown in Fig. 2. It will therefore be seen that as the chain 36 is moved by the rotation of the shaft 29 and the sprocket 34, the sprocket 35 and the shaft 31 are rotated.

Pivottally mounted upon the shaft 30^a and extending upwardly and forwardly therefrom, are a plurality of plunger arms 39 on the forward ends of which are arms 40 extending upwardly and downwardly from the ends of the arms 39. On the lower ends of the arms 40 are heavy plunger heads 41, each of which is in outline, when viewed from above, in the form of a parallelogram, as shown in Fig. 1. The arms 39 are spaced apart at such distances and the plunger heads are of such width that a slight space is left between each of the plunger heads 41. On each of the arms 39, approximately above the shaft 31, is mounted a small roller 42. On the shaft 31 are mounted a plurality of cams 43, which engage the rollers 42 and raise the arms 39 as the shaft 31 is rotated. The cams 43 are so located on the shaft 31 that the arms 39 are raised and permitted to drop in succession. It will be seen that as the shaft 31 is rotated, the arms 39 will be permitted to drop in succession. The surface of the road is thereby pounded or tamped by the plunger heads 31. Mounted on the frame 26 is a transverse member 44 on which are forwardly extending flat springs 45 which engage the lugs 46, on the lower sides of the arms 39 when the arms 39 are at the lower position of their movement, and thereby exert yielding pressure to hold the plunger heads 41 a short distance above the point of the lower limit of their movement. These springs also prevent or limit the vibration of the arms 39 and thereby tend to prevent crystallization and breaking of said arms, due to constant use.

For cleaning the under surfaces of the plunger heads 41, I have provided the following mechanism: Pivottally mounted on the shaft 30^a, adjacent to each of the arms 39, is a cleaner arm 47 extending upwardly and forwardly from the shaft 30. Pivoted to the forward and upper end of each of the arms 47 is a downwardly and rearwardly extending link 48. Pivoted to the lower end of each link 48 is a short arm 49, in the forward end of which is a scraper blade 50.

Mounted on the end of each arm 49 which extends rearwardly from the point where said arm 49 is pivoted to the link 48, is a roller 51. Mounted on the transverse member 44 or any other suitable part of the frame 26 are a plurality of slotted cams 52. Each of the rollers 51 travels in one of the cams 52. The downward movement of the arms 47 and the cleaner mechanism connected therewith, is limited by the cams 52. On each of the arms 39 is a laterally extending lug 60 designed to engage the adjacent arm 47 as the arm 39 is raised, and to raise the arm 47 with the arm 39. The cam 52 is so located and arranged that as the arms 47 and 39 continue to move upwardly, the scraper blade moves forwardly scraping the lower surface of the plunger head 41, as shown in Fig. 3.

It will be noted that during the upward movement of the plunger head and the cleaning mechanism, there is some friction between the roller 51 and the rearward part of the cam 52, thereby tending to lower the rear end of the arm 49 and to raise the scraper blade 50 and to cause said blade to scrape the under surface of the plunger head 41. When the plunger and the cleaning mechanism start on the outward stroke, the chief friction of the roller 51 is against the forward part of the cam 52, thereby tending to raise the rearward end of the arm 49 and to lower the scraper blade away from the plunger head 41. During this movement, the arm 49 and the scraper blade 50 move pivottally with relation to the link 48.

For cleaning the sides of the plunger heads 41, I provide brackets 55 on which are a plurality of scrapers 56 which extend to position where they will approximately engage the sides of the plunger heads 41 as the latter move upwardly.

On the sides of the frame 26 are upwardly extending brackets 57 which are connected at their upper ends by a transverse member 58. On the transverse member 58 are a plurality of upwardly and forwardly extending springs 59 which engage the upper ends of the arms 40, at the upper limit of their movement, and exert yielding pressure to start the downward movement of the plunger head. The action of the springs 49 is illustrated in Fig. 2.

Mounted on the forward part of the movable platform 26 is a hopper 60 extending across the machine. In the hopper 60 are two transverse shafts 61 and 62 on which are grates 63, which may be tilted by the rotation of the shafts 61 and 62. Mounted on the shafts 61 and 62 are half gears 64 in mesh with each other. The grates 63 are tilted for discharging the contents of the hopper by the following means: On one end of the shaft 62 is a lever arm 65 provided

with a plurality of openings 66. Pivoted to the lever arm 65 by means of a bolt 67 mounted in one of the openings 66, is a rearwardly extending link 68. On the link 68 are inwardly extending lugs 69 and 70 in which is slidably mounted a link 71. The link 71 is pivoted to a lever arm 72 on the shaft 31. On the link 71, approximately midway between the lugs 69 and 70, is a block 73. Between the block 73 and the lugs 69 and 70, are coil springs 74 and 75. It will be seen that as the shaft 31 is rotated, the links 71 and 68 and the lever arms 72 and 65, will partially rotate the shaft 62 and thereby tilt the grates 63. In this connection it will be noted that the lever arm 65 is longer than the lever arm 72 so that the shaft 62 is never rotated a full revolution, but is reciprocated.

For throwing out of gear the mechanism for operating the grates and the plungers, I have provided on the sprocket gear 35, a clutch member 77. On the shaft 31 is keyed a clutch member 78. In the clutch member 78 is a groove 79. The clutch member 78 is operated by means of a pin in one end of the lever 80, which is centrally pivoted on a portion of the frame 26.

Mounted on the frame 10 are downwardly extending brackets 81. The brackets 81 are provided with slots 82 in which are received bolts 83 whereby the brackets are adjustably secured to the frame 10. Mounted on the forward, lower side of the brackets 81 is a transverse blade 84 designed to level the material discharged from the hopper 60.

For advancing the movable platform on the fixed platform during the operation of the machine, I provide the following means: On the side of the fixed platform opposite the side on which the chain 36 is located, is a notched bar 86. Mounted on the shaft 31 on the end thereof opposite the sprocket 35, is a gear wheel 87. Mounted on the frame 26 is a small gear wheel 88 in mesh with the gear wheel 87. Pivoted off center on the gear wheel 88, is a pawl 89 designed to engage the notches in the bar 86. It will be seen that as the gear wheel 87 is rotated, the pawl 89 will be drawn forwardly and will then be forced against the notches in the bar 86 and will force the platform 26 forwardly. The relative size of the gears 87 and 88 is such as to advance the platform 26 a certain predetermined distance for each revolution of the shaft 31. To prevent rearward movement of the platform 26, while the pawl 89 is being drawn forwardly, I mount on the platform 26, a spring actuated pawl 90 designed to engage the notches in the bar 86. The gear 88 is mounted on a stub shaft 91. Pivoted to the stub shaft 91 is a lever 92. Fixed to the pawl 90 is an upwardly extending arm 93. The lever 92 and the arm 93 are each piv-

oted to a link 94. On the lever 92 is an arm 95 on which is a pin 96. The parts just described, are so located and arranged that when the lever 92 is thrown forwardly, the pawl 90 and the pawl 89 are drawn out of engagement with the notches in the bar 86. In this operation, the pin 96 engages the under surface of the pawl 89 and raises said pawl. When the pawls 89 and 90 are out of engagement with said notches, the chain 36, which travels in the direction indicated by the arrow in Fig. 2, tends to draw the platform 26 rearwardly. On the platform 26 I mount a lever 97 having a cam shaped end 98 designed to engage the chain 36 above the sprocket 35 to thereby carry the platform 26 rearwardly.

In the practical operation of my improved road making machine, a belt from any suitable source of power is connected with the belt pulley 30. The hopper 60 is filled with any suitable material. When the wheel 30 is rotated, the chain 36 through the sprocket 35 rotates the shaft 31 and thereby alternately raises the arms 39, thus alternately raising and dropping the plunger heads 41. As the plunger heads are raised, their lower surfaces are cleaned by means of the mechanism heretofore described, and their sides are also cleaned by means of the scraper arms 56. When the arms 40 reach the upward limit of their movement they engage the springs 59, which exert yielding pressure to start the downward stroke of the plungers. Near the lower position of the arms 39, the lugs 46 engage the springs 45, which lift the arms 39 a short distance above the point of the lower limit of their movement. If it is desired to discharge the contents of the hopper, a pin 99 in the crank 72 is removed and the arm 71 is removed from said crank. The machine may be thrown out of gear at any time by the operation of the lever 80. The tilting motion imparted to the grates 63 may be regulated by placing the bolt 67 in different holes 66.

When the platform 26 is advanced to the forward limit of its movement on the platform 10, the pawls 89 and 90 may be thrown out of engagement with the notches in the bar 86 by means of the lever 92 and the lever 97 may be raised to cause the sprocket 35 and the movable platform to travel with the chain 36 rearwardly with relation to the platform 10. The machine may then be moved forwardly by any suitable traction power and the operation of tamping repeated.

It will be seen that a great many changes may be made in the construction of my machine without departing from its essential features.

The removable frame and the mechanism thereon may be used independent of the

fixed frame, and may be propelled by any suitable motive power.

Among the many advantages of my improved road making machine, are the arrangement of the cams 43 whereby the plungers are alternately raised, thereby permitting the machine to operate without any considerable variation in the amount of power necessary for rotating the shaft 31. The movable platform is moved forwardly by the mechanism heretofore described, as the tamping process is carried on. The same power which works the tamping arms and plunger heads, and operates the hopper, advances the movable platform on the fixed platform and returns the movable platform to its rearward position. The form of the plunger heads, the lower surfaces of which are in the shape of a parallelogram, leaves no untamped strip in the road. The rear part of the fixed platform is carried by the rollers 18. There are two of the rollers 18 steered by the mechanism heretofore described, thereby enabling me to accomplish somewhat the same purpose as would be accomplished by a differential gear.

I claim as my invention:

1. In a device of the class described, a frame, a plurality of tamping means mounted on said frame and means operating said tamping means, a hopper located in front of said tamping means, means for discharging the contents of said hopper in the path of said tamping means and a scraper arranged between said hopper and said tamping means.

2. In a device of the class described, a frame, a plurality of tamping devices operatively mounted thereon, a transverse shaft, means on said shaft for operating said tamping devices, a hopper arranged in front of said tamping devices and means operated from said shaft for discharging the contents of said hopper in the path of said tamping devices.

3. In a device of the class described, a frame, a plurality of tamping means mounted thereon, means for operating said tamping means, means for cleaning the under surfaces of said tamping means and means for operating said cleaning means.

4. In a device of the class described, a frame, a plurality of tamping means mounted thereon, means for operating said tamping means, means for cleaning the under surfaces of said tamping means, means for cleaning the sides of said tamping means and means for operating said cleaning means.

5. In a device of the class described, a frame, a plurality of plunger heads, means for alternately raising said plunger heads, means for cleaning the lower surfaces of said plunger heads, during their upward

movement and means for operating said cleaning means.

6. In a device of the class described, a frame, a transverse shaft mounted therein, an arm pivoted to said shaft, a plunger mounted on the upper end of said arm, means for raising said arm and means for cleaning the under surface of said plunger, said means comprising a scraper blade and means for moving said blade along the under surface of said plunger.

7. In a device of the class described, a frame, a transverse shaft mounted therein, an arm pivoted to said shaft, a plunger mounted on the upper end of said arm, means for raising said arm, means for cleaning said plunger said means comprising a pivoted arm pivoted on said transverse shaft and of approximately the same length as said first named arm, a downwardly extending link pivoted to said second named arm, a scraper blade pivoted to said link having a rearwardly extending arm; a slotted cam, a roller on said rearwardly extending arm, designed to travel in said cam, said parts being so arranged that said scraper blade passes across the lower surface of said plunger during the upward movement thereof.

8. In a device of the class described, a frame, a transverse shaft mounted therein, a plurality of arms pivoted to said shaft, a plunger or tamper on each of said arms, means for alternately raising said arms, and means for cleaning the sides of said plungers, said means comprising scraper blades so located as to scrape the sides of said plungers during their upward movement.

9. In a device of the class described, a fixed frame, a movable frame rotatably mounted thereon, a plurality of tamping devices mounted on said movable frame, means for alternately raising said tamping devices, a hopper on said movable frame, movable grates in said hopper, and means for operating said grates.

10. In a device of the class described, a fixed frame, a movable frame mounted thereon, a plurality of tamping devices on said movable frame, a power shaft rotatably mounted on said fixed frame, an idler shaft mounted on said fixed frame, a driven shaft mounted on said movable frame, means whereby said tamping devices are operated by the rotation of said driven shaft, sprocket wheels on said shafts, a sprocket chain on said sprocket wheels, and means for advancing said movable frame on said fixed frame when said driven shaft is operated.

11. In a device of the class described, a fixed frame, a movable frame mounted thereon, a plurality of tamping devices on said movable frame, a power shaft rotatably mounted on said fixed frame, an idler shaft mounted on said fixed frame, a driven shaft

mounted on said movable frame, means whereby said tamping devices are operated by the rotation of said driven shaft, sprocket wheels on said shafts, a sprocket chain on
 5 said sprocket wheels, means for advancing said movable frame on said fixed frame when said driven shaft is operated, said means comprising a notched bar on said
 10 fixed frame, a gear wheel on said driven shaft, a gear wheel on said movable frame, in mesh with said first gear wheel, a bar pivoted off center on said second gear wheel and designed to engage the notches on said
 15 bar, and means for securing said movable frame against movement in one direction.

12. In a device of the class described, a fixed frame, a movable frame mounted thereon, a plurality of tamping devices on said movable frame, a power shaft rotatably
 20 mounted on said fixed frame, an idler shaft mounted on said fixed frame, a driven shaft mounted on said movable frame, means whereby said tamping devices are operated by the rotation of said driven shaft, sprocket
 25 wheels on said shafts, a sprocket chain on said sprocket wheels, means for advancing said movable frame on said fixed frame when said driven shaft is operated, said means comprising a notched bar on said
 30 fixed frame, a gear wheel on said driven shaft, a gear wheel on said movable frame, in mesh with said first gear wheel and designed to engage the notches in said bar for means for securing said movable frame
 35 against movement in one direction, said means comprising a spring actuated pawl designed to engage the notches in said bar.

13. In a device of the class described, a fixed frame, a movable frame mounted there-

on, a plurality of tamping devices on said 40 movable frame, a power shaft rotatably mounted on said fixed frame, an idler shaft mounted on said fixed frame, a driven shaft mounted on said movable frame, means whereby said tamping devices are operated 45 by the rotating of said driven shaft, sprocket wheels on said shafts, a sprocket chain on said sprocket wheels, means for advancing said movable frame on said fixed frame when said driven shaft is operated, said 50 means comprising a notched bar on said fixed frame, a gear wheel on said driven shaft, a gear wheel on said movable frame, in mesh with said first gear wheel, a pawl pivoted off center in said last named gear 55 wheel and designed to engage the notches in said bar, a spring actuated pawl mounted on said movable frame and designed to engage said notches and means for moving both of said pawls out of engagement with 60 said notches.

14. In a device of the class described, a frame, a plurality of tamping devices operatively mounted with relation to said frame, means for operating said tamping devices, 65 supporting wheels mounted on the front end of said movable frame, in line with each other, rollers mounted beneath the rear end of said frame and means for moving said rollers with relation to said frame for the 70 purpose of steering the device when it is propelled in any direction.

Des Moines, Iowa, April 18, 1912.

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Witnesses:

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