Sept. 18, 1934. A. J. CLAUSEN 1,974,013

CONCRETE SPREADER

Filed Nov. 27, 1931 4 Sheets-Sheet 1

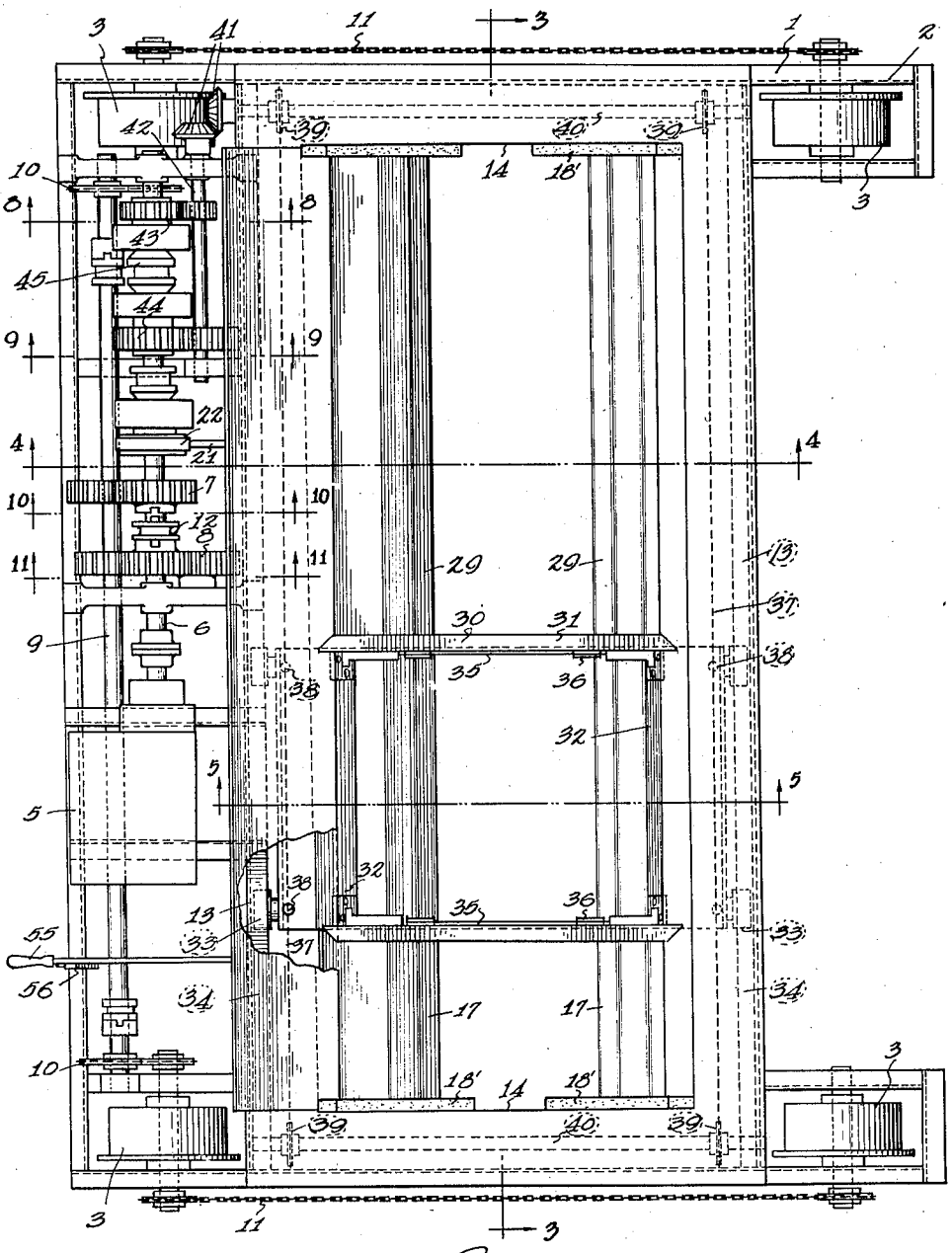


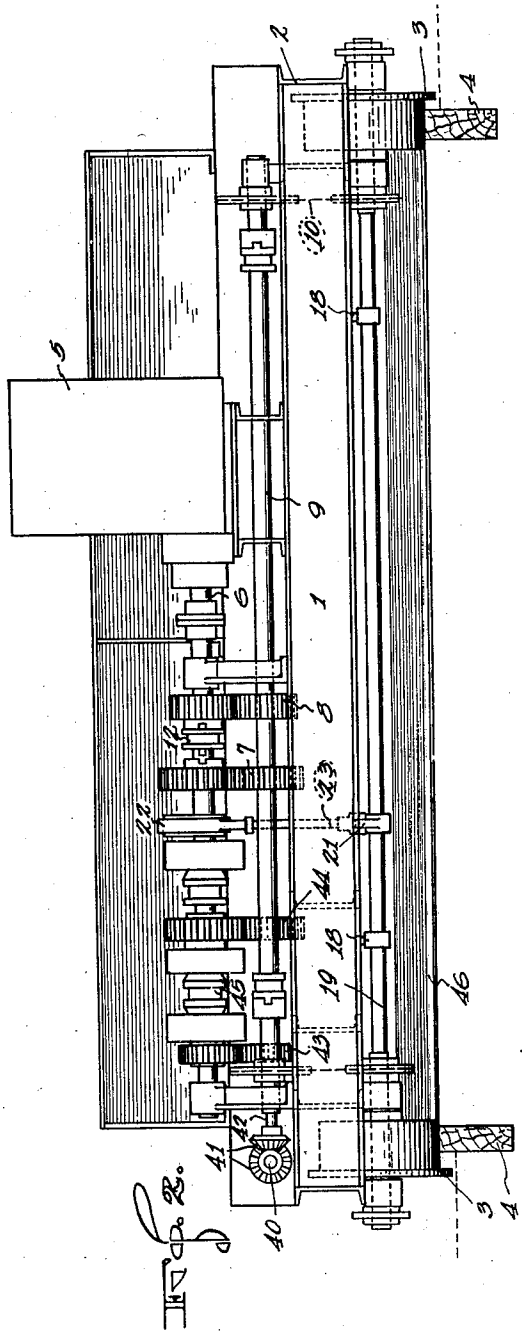
Fig. 1.

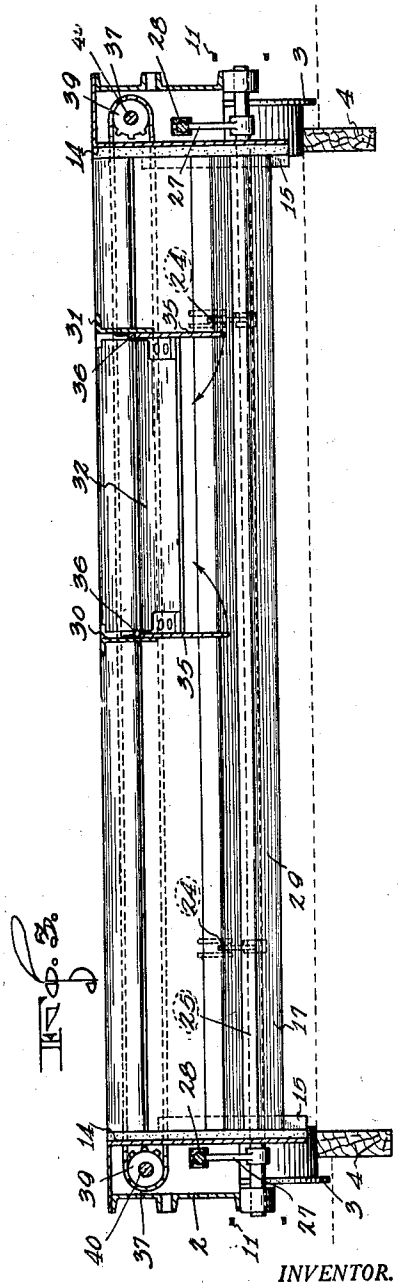
INVENTOR.
ANDREW J. CLAUSEN.
BY Munn & Co.
ATTORNEYS.

Sept. 18, 1934. A. J. CLAUSEN 1,974,013

CONCRETE SPREADER

Filed Nov. 27, 1931 4 Sheets-Sheet 2





INVENTOR.
ANDREW J. CLAUSEN.
BY Munn & Bot
ATTORNEYS.

Sept. 18, 1934. A. J. CLAUSEN 1,974,013

CONCRETE SPREADER

Filed Nov. 27, 1931 4 Sheets-Sheet 3

Fig. 4.

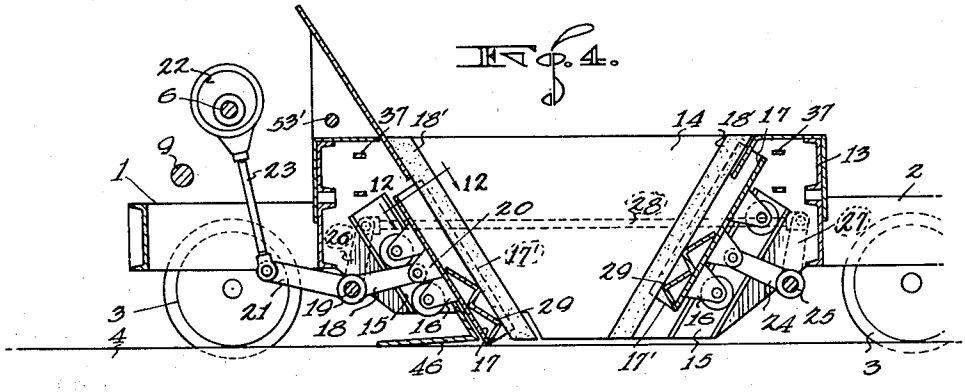


Fig. 5.

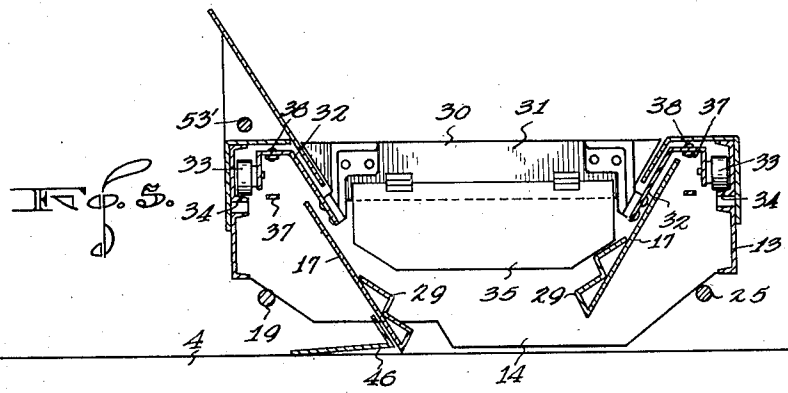
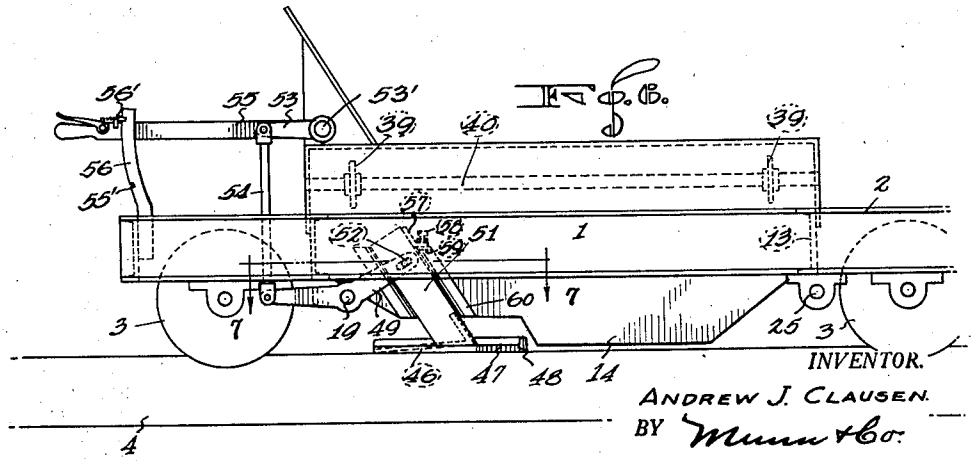


Fig. 6.



INVENTOR.
ANDREW J. CLAUSEN.
BY Munn & Co.
ATTORNEYS.

Sept. 18, 1934. A. J. CLAUSEN 1,974,013

CONCRETE SPREADER

Filed Nov. 27, 1931 4 Sheets-Sheet 4

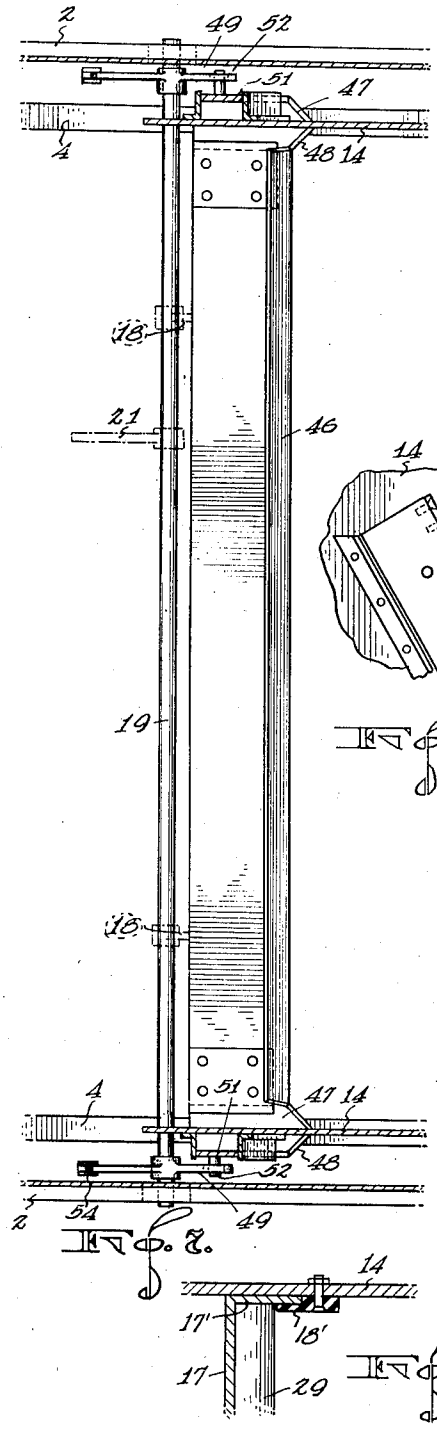


Fig. 7.

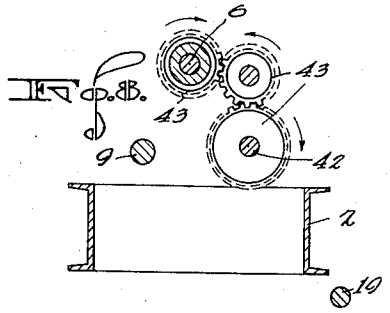


Fig. 8.

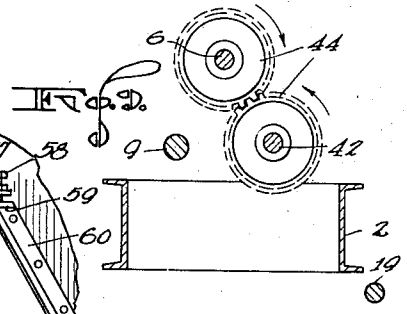


Fig. 9.

Fig. 10.

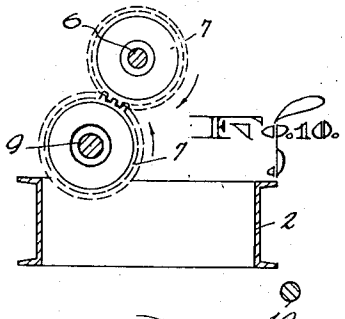


Fig. 11.

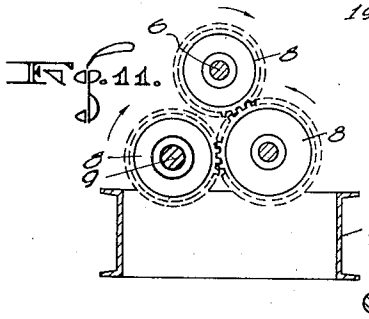


Fig. 12.

INVENTOR.
ANDREW J. CLAUSEN.
BY Munn & Co.
ATTORNEYS.

Patented Sept. 18, 1934

1,974,013

UNITED STATES PATENT OFFICE

1,974,013

CONCRETE SPREADER

Andrew J. Clausen, Berkeley, Calif.

Application November 27, 1931, Serial No. 577,671

11 Claims. (Cl. 94—44)

The present invention relates to improvements in concrete spreaders adapted to be used in road construction, and its principal object is to provide a concrete spreader that will uniformly spread concrete simultaneously over the entire width of a road bed. A further object of the invention is to provide means for continuously agitating the concrete while it is being fed uniformly over the road bed.

A further object of the invention is to provide means for advancing over the road bed a body of concrete substantially co-extensive in length with the width of the road bed for discharging concrete thereon, and to provide means in combination therewith for maintaining the body at uniform cross-section as new concrete is added thereto.

A further object of the invention is to provide means following the advancing body of concrete for striking off and leveling the discharged concrete whereby a single operation is made to place the concrete on the road bed in its final form.

Further objects and advantages of my invention will appear as the specification proceeds.

The preferred form of my invention is illustrated in the accompanying drawings in which

Figure 1 shows a top plan view of my invention;

Figure 2 a rear view thereof;

Figure 3 a cross section taken along line 3—3 of Figure 1;

Figure 4 a longitudinal section through my machine taken along line 4—4 of Figure 1;

Figure 5 a longitudinal section through a portion of my machine taken at line 5—5 of Figure 1;

Figure 6 a side view of my machine;

Figure 7 a horizontal section through a portion of my machine taken along line 7—7 of Figure 6;

Figure 8 a longitudinal section through a part of my machine taken along line 8—8 of Figure 1;

Figure 9 a similar section taken along line 9—9 of Figure 1;

Figures 10 and 11, similar sections taken along lines 10—10 and 11—11 respectively of Figure 1; and

Figure 12 a detail view taken along line 12—12 of Figure 4.

Figure 13, a detail view showing adjusting means for a trowel plate.

While I have shown and described only the preferred form of my invention, I wish to have it understood that various changes and modifications may be made within the scope of the claims hereto attached without departing from the spirit of the invention. More particularly I wish to have it understood that my machine may be used for spreading asphaltum or any other road material to which it may be adapted.

In its preferred form my machine comprises a carriage 1, including a frame 2, of rectangular form, open in front and supported by four wheels 3 adapted to ride on header boards 4 arranged on opposite sides of the road bed in conventional road construction. It will be understood that the header boards are arranged in such a manner that the top edges of the header boards are on a level with the surface of the road to be constructed and serve as a guide for the filling operation. It should be understood that while for the purposes of the illustration of my invention it is assumed that the road is to be constructed with a level surface, the same machine may be used with some slight changes in form for producing a cambered surface.

The rear wheels are preferably driven from one source of power indicated at 5 such as a gasoline engine mounted on the rear portion of the carriage and connected through a shaft 6, either one of two sets of gears 7 and 8, the shaft 9 and a chain drive 10. The front wheels are driven from the rear wheels through chains 11. Of the two sets of gears 7 and 8, the former is for direct drive and the latter for reverse drive, a suitable clutch mechanism 12 being interposed for selective use of one or the other.

The carriage supports a strong rectangular frame 13 made preferably of channel irons and extending transversely across the carriage between the front and rear wheels respectively. The end members 14 of this frame have slanting guide rails 15 fixed to the inner faces thereof in suitable spaced relation, each of these rails serving as a support for a truck 16 carrying a plate 17, the two plates being arranged in converging relation and extending throughout the length of the frame so as to form an open bottom trough or hopper coextensive in length with the width of the road bed. Each of these plates 17 is formed with end flanges 17′ lying against the faces of the end plates 14 and covered in part by rubber strips 18′ as indicated in Figures 4 and 12. The two trucks of each end wall are moveable on their rails so as to allow the two plates 17 to be reciprocated. The rear plate 17 is reciprocated by means of two arms 18 fixed

to the shaft 19 and pivoted to lugs 20 projecting from the under face of the plate 17, rocking motion being imparted to the shaft 19 by a second arm 21 operated from an eccentric 22, through a connecting link 23. The eccentric 22 is fixed to the shaft 6. The front plate 17 is reciprocated by means of two arms 24 extending from the transverse shaft 25, which latter is made to follow the rocking motion of the shaft 19 by means of two arms 26 and 27, and a connecting link 28. It will be seen that in this manner the two plates 17 forming the hopper are reciprocated in opposite directions, one going up while the other one goes down and vice versa. Each of the plates is turned over at its bottom to provide a series of steps 29 extending from the inner face of the plate throughout the length thereof.

In operation when the hopper defined by the two plates 17 and the two end walls 14 is filled with concrete and the carriage is made to advance and the plates 17 are made to reciprocate, the entire body of concrete will be under continuous agitation, and due to the steps 29, will be rocked back and forth and at the same time driven downward to be discharged upon the road bed through the opening between the two plates 17.

It should be observed that this particular construction not only allows the concrete to be fed upon the road bed simultaneously over the entire width thereof but it also continues the process of mixing the concrete to the very point where it is discharged in its permanent place upon the road bed, whereby the resulting bed of concrete is much improved over a bed made in the conventional manner by first discharging the concrete upon the road bed in piles, then spreading the piles by manual labor, and thereafter grading the concrete by machinery. The steps are arranged so that their under faces are almost at right angles with the plate 17, while the upper faces are disposed at a more acute angle which causes the concrete to be thrown inwardly in a rocking motion on the upward movement of each plate, and which causes the concrete to be tamped downward upon the road bed on the downward movement of each plate.

The hopper consisting of the two plates 17 has also means associated therewith in the shuttle 30 for evenly spreading concrete discharged into the hopper. This shuttle or leveler comprises a frame 31 of considerably less length than the hopper, and is suspended over the hopper by hangers 32 formed to extend over the upper edges of the two plates 17 and supported on four wheels 33 riding on tracks 34 provided on the inner faces of the frame 13. The end walls of the shuttle 30 have plates 35 suspended therefrom by means of hinges 36 arranged in such a manner that each plate 35 may swing inwardly but not outwardly. The bottom edge of each plate extends substantially halfway into the hopper, the depth of the plate depending somewhat upon the amount of concrete to be discharged at one time into the hopper. The plates 35 are sufficiently long to extend substantially from one plate 17 to the other plate 17, but in such a manner as to clear the steps 29 in their uppermost position. The shuttle may be moved back and forth over the hopper (so as to level material dumped thereinto) by means of chains 37, fastened to the hangers 32 as at 38, and passing over sprockets 39 on two shafts 40 running along the edges of the carriage, one of the shafts 40 being driven through beveled gears 41 from a jack shaft 42, which latter may receive revolving motion from the shaft 6 through either the direct gearing 43 or the reverse gearing 44, a suitable clutch mechanism 45 being provided for rendering one or the other of the two gears active.

When concrete is dumped into the shuttle and the latter is made to advance in one or the other direction, the advance plate 35 may swing inwardly to clear obstacles presented in the shape of material lying outside the shuttle, while the rear plate 35 is held in vertical position and pushes any material rising beyond its bottom edge in front of it, and leveling the concrete evenly over the entire hopper. One trip back and forth will usually be sufficient to evenly spread a new charge over the entire surface of the hopper.

After the material has been discharged from the bottom of the hopper so as to be uniformly distributed over the entire width of the road bed, it is engaged by the strike-off trowel 46 which extends transversely through the machine immediately following the rear plate 17, the trowel being made in the form of a strip of metal of proper width arranged at a slight angle to the road bed so that its leading edge is slightly higher than the ultimate height of the road bed, while its rear edge is on a level with the header boards defining the ultimate height of the road bed. This trowel plate is supported on two shoes 47 adapted to ride on the two header boards and formed with V-shaped angles or flanges 48 adapted to divert material lying on the top surface of the header boards either toward the road bed or toward the outside.

It will be seen that this trowel strikes off the concrete simultaneously over the entire width of the road bed, and has a certain squeegee action which leaves the surface of the road bed in a smooth and firmly packed condition. The trowel board may be raised into inoperative position by means of arms 49, which are loosely journalled on the shaft 19, and engage with end pieces 51 rising from the shoes 47 through a pin and slot arrangement 52. The arms 49 may be rocked by means of a second pair of arms 53 fastened near the ends of a transverse shaft 53' and connected with the arms 49 through links 54 (see Fig. 6). A manually actuated lever 55 is attached to the shaft 53' and may be moved for raising or lowering the trowel. An upright 56 is provided with notches 55' for receiving a conventional latch 56' on the lever 55 and thus secure the latter in adjusted position.

The end pieces 51 of the shoes 47 and the trowel ride between guides 60 fastened to the end walls 14 and each of the end pieces is formed with a clip 57 adapted to rest on a flange 59 (see Figure 13) of one of the guides 60 when the trowel is in operative position. In case it should be desired to raise the trowel slightly relative to the header boards, I provide a screw adjustment as shown at 58 which allows the member 51 to be raised relative to the guides 60.

The operation of the machine is substantially as follows: After the main carriage has been properly placed on the header boards, the concrete is dropped more or less promiscuously into the hopper by any suitable loading device. Preferably a major quantity of the concrete is dropped over the shuttle 30 wherever it may be at that time. The shuttle is then made, by suitable operation of the clutch mechanism 45,

to move back and forth over the entire hopper whereby the concrete is spread over the entire hopper area to a uniform height.

Simultaneously with this leveling of the material in the hopper, the plates 17 will be reciprocated whereby the entire body of concrete is agitated in a certain rocking motion, and fed downwardly upon the road bed as the carriage advances. The trowel plate 46 strikes off superfluous material and firmly presses the remaining material upon the road bed so as to leave an even and finished surface. It will be noted that advance movements of the truck are under the control of the operator independently of the control of the shuttle movement so that the operator at any time may stop the whole carriage if the spreading operation does not keep up with the advance of the machine. In this manner a firm and solid bed of concrete is obtained from freshly mixed material, and all manual labor in the spreading of material is eliminated.

I claim:

1. A concrete spreader for a road bed comprising a carriage adapted for movement in the direction of the road bed and a transversely extended hopper carried thereby, both walls of the hopper being slanting and reciprocable for feeding material to the road bed.

2. A concrete spreader for a road bed comprising a carriage adapted for movement in the direction of the road bed and a transversely extended hopper carried thereby, the walls of the hopper having feeding projections on the inner surface thereof and being reciprocable for feeding material to the road bed.

3. A concrete spreader for a road bed comprising a carriage adapted for movement in the direction of the road bed, a transversely extended hopper carried thereby and having movable front and rear walls, trucks supporting the said walls of the hopper, supporting rails for the trucks and means for reciprocating the trucks whereby the hopper walls are moved for feeding material to the road bed.

4. A concrete spreader for a road bed comprising a carriage adapted for movement in the direction of the road bed, a transversely extended hopper carried thereby, trucks supporting the walls of the hopper, supporting rails for the trucks and means for reciprocating the trucks whereby the hopper walls are moved for feeding material to the road bed, registering trucks of opposing walls being interconnected for operation by a common actuating element.

5. A concrete spreader for a road bed comprising a transversely extended hopper movable over the road bed and a shuttle movable in the hopper, the shuttle including a hinged longitudinal plate free to swing in one direction only.

6. A concrete spreader for a road bed comprising a transversely extended hopper movable over the road bed and a shuttle movable in the hopper, the shuttle comprising a cage having end walls adapted to level material and the end walls being swingable in one direction.

7. In a concrete spreader for a road bed, means for agitating a body of concrete while discharging therefrom comprising two converging walls arranged to leave a discharge slot therebetween and means for reciprocating the two walls in converging planes.

8. In a concrete spreader for a road bed, means for agitating a body of concrete while discharging therefrom comprising two converging walls arranged to leave a discharge slot therebetween and means for reciprocating the two walls, the walls having steps on the confronting faces thereof to impart a rocking motion to the body of concrete.

9. A concrete spreader for a road bed comprising a frame having front and rear and end members, converging tracks mounted on the end members, trucks riding on said tracks and having plates coacting in forming a hopper and means for reciprocating the trucks.

10. A concrete spreader for a road bed having header boards along the edges thereof comprising a wheel-supported frame adapted to ride on the header board, inclined guideways on the frame and a trowel plate extending across the road bed and having inclined end pieces adjustably secured to the guideways.

11. In a concrete spreader for a road bed, means for advancing an elongated body of concrete over the road bed arranged to simultaneously feed concrete to the road bed from the entire length thereof, and including a pair of supporting elements mounted with freedom of reciprocating movement in converging planes and engaging opposite sides of the body for rocking the entire body back and forth.

ANDREW J. CLAUSEN.