J. D. CLARKSON.

PROCESS OF AND APPARATUS FOR MAKING ROADS.

APPLICATION FILED AUG. 28, 1915.

1,206,751.

Patented Nov. 28, 1916.

2 SHEETS—SHEET 1.

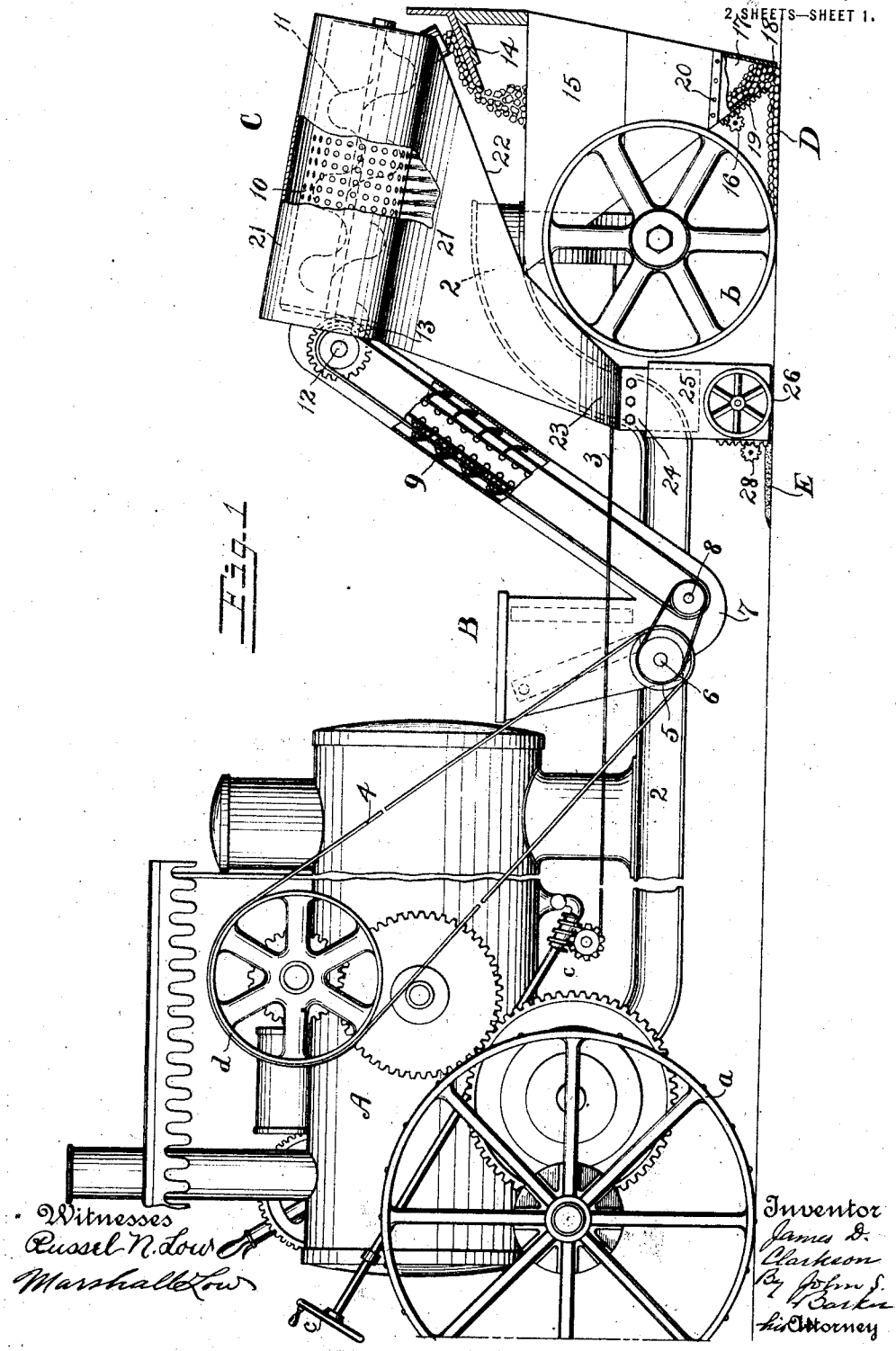

Fig. 1

Witnesses
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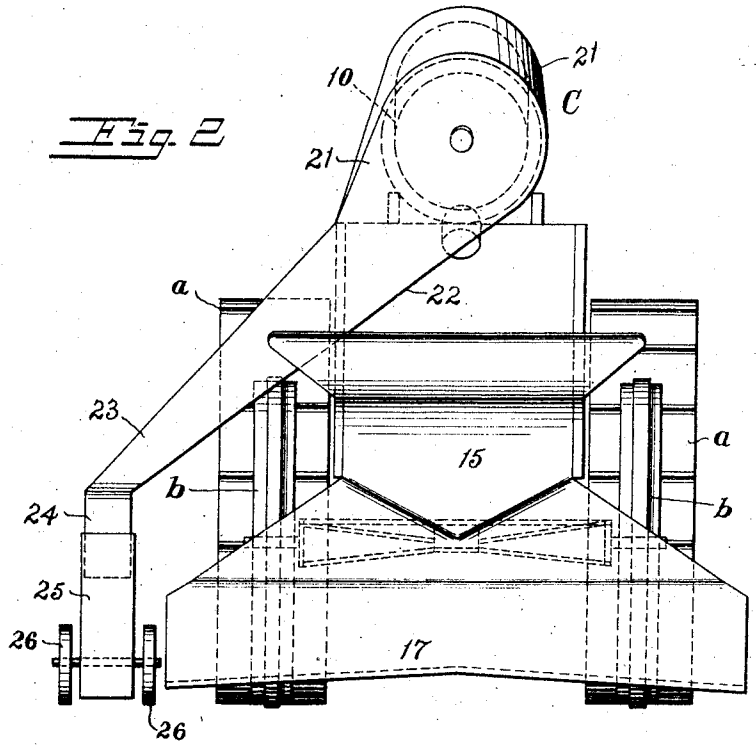
2 SHEETS—SHEET 2.

Fig. 2



Witnesses:
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UNITED STATES PATENT OFFICE.

JAMES D. CLARKSON, OF CARTHAGE, MISSOURI.

PROCESS OF AND APPARATUS FOR MAKING ROADS.

1,206,751. Specification of Letters Patent. Patented Nov. 28, 1916.

Application filed August 28, 1915. Serial No. 47,842.

To all whom it may concern:

Be it known that I, JAMES D. CLARKSON, a citizen of the United States, residing at Carthage, in the county of Jasper and State of Missouri, have invented certain new and useful Improvements in Process of and Apparatus for Making Roads, of which the following is a specification.

My invention relates to an apparatus for, and a novel method of, constructing road surfaces from crushed rock.

The invention contemplates and has reference to the production of the wearing surface of a roadway, the body of which is composed of a sheet or layer of considerable thickness formed of relatively coarse broken rock, the spaces between the pieces of which are filled with earth or the very fine stuff produced in crushing rock that serves as a binder or filler, and which layer or sheet, thus filled, is compacted, as by a heavy roller, and has applied to it a thin coating of fine broken stone which, upon being rolled or compacted, unites with the body of coarser material to which it is applied and becomes a smooth, and largely impervious, cover therefor. It is to produce in an economical, rapid, and satisfactory manner a roadway of this kind that my invention has been made.

In the accompanying drawings, Figure 1 is a side elevation of apparatus, embodying my invention and by which it may be carried out. Fig. 2 is a front view of the apparatus showing particularly the screening and distributing devices.

In the accompanying drawing, A designates a tractor which may be of any usual or preferred construction. It preferably has broad traction wheels *a* and other features of a machine of this kind, which need not be herein described.

The longitudinal sills of the apparatus extend from under the tractor a considerable distance in front thereof and are arranged to support a rock crusher B, which may be of any suitable or preferred type, a screen or separator C for the products of the rock crusher, and storage bins or receivers for the material separated by the screen. The front steering wheels *b* such as the tractor is ordinarily provided with, are suitably supported at the forward ends of the sill pieces 2. The axle or swiveled support for these wheels is connected with the steering mechanism *c* by links or cables 3 or other suitable connections, so that the apparatus may be steered from the rear of the tractor where the attendant and driver will usually be stationed. The rock crusher is driven from the fly wheel *d* of the tractor, a belt 4 uniting such wheel with a pulley 5 upon the main driven shaft 6 of the rock crusher.

The product of the stone crusher B drops into a receiver 7 from which it is taken by a conveyer 9 to the screen or separator C, where it is separated into, preferably, two grades,—coarse material suitable for the foundation and main body of the road bed, and fine material adapted to serve as a top dressing and coating therefor. The separator C may be of any suitable or preferred kind. I have represented it as consisting of a rotary screen 10 in which is arranged a screw or worm conveyer 11 adapted to positively force the material delivered to the screen through it lengthwise, regardless of the grade or incline on which the apparatus may be working. The screen is driven from the engine of the tractor. While I have not illustrated the driving gear in detail, I have indicated that the lower shaft 8 of the conveyer 9 is belted to the shaft 6 of the rock crusher, and also to a shaft 12 at the head end of the conveyer, which shaft, through gearing 13, drives the separator.

The coarse material that does not pass through the screen is forced out through the delivery end thereof and received upon a chute or conveyer 14 that delivers to a receiving and collecting receptacle 15. This receptacle is supported in suitable framework carried by the supporting and steering wheels *b* and the sill pieces 2 of the framework. It terminates in a delivery spout 17 extending transversely across the track of the apparatus. This spout is preferably relatively narrow, considered on lines fore and aft of the apparatus, but is of a width corresponding with the width of the sheet of rock material that is to be delivered by the machine at one time. This latter dimension may be equal to the width of the roadway being made, or less, as circumstances may dictate, but is usually somewhat greater than the width of the tread base of the tractor, as represented in Fig. 2. The front edge 18 of the spout preferably extends quite close to the surface of the ground and serves to prevent an undesirably free delivery of the material from the receptacle 15. The rear edge 19 does not extend quite so low as the

front edge and determines the thickness of the layer of rock delivered, besides operating as a leveling device for the upper surface thereof. It is preferably adjustable, as by means of a rack and pinion, 16, permitting a greater or less thickness of rock to be delivered as may be desired.

The spout section 17 of the receiving and collecting receptacle 15 is preferably easily removable, being united with the main portion of the receptacle by bolts 20. The spout will usually be removed when the apparatus is not in use, especially when it is moving from place to place, in order to prevent it from being broken by engagement with objects projecting from the surface of the ground.

The fine material that passes through the screen is collected by a casing or jacket 21 that preferably completely surrounds the screen circumferentially, and is formed with an inclined bottom 22 leading to a spout 23 that is located laterally to one side of the apparatus so as to discharge outside of the roadway being produced, that is, beyond the side edge of the crushed rock layer being delivered by the spout 17. The outer end 24 of this spout is preferably vertically disposed and is adapted to have applied to it a telescopic extension 25, the delivery end of which is close to the surface of the ground. The section 25 is preferably supported by wheels 26, so that it is free to move upward and downward and thus follow the surface of the ground over which it passes. Its rear wall is preferably vertically adjustable so that the flow of material may be regulated, there being adjusting devices 28 provided for regulating and setting this spout at will.

In using an apparatus such as described for building a roadway, it is taken to the place of beginning the desired improvement, when the engine of the tractor is started, being disconnected from the traction wheels *a*, but in driving connection with the rock crusher. Sufficient rock is then crushed to fill the receptacles 15 and 23, whereupon the engine is connected with the traction wheels and the apparatus slowly moved over the roadway. The separator C and the adjacent parts are the advance elements of the apparatus, so that the layer of coarse crushed rock, D, that is laid upon the prepared earth surface is rolled and compacted by the tractor which immediately follows. As will be seen, the delivery spouts 17 and 25 are open-ended, and are supported so that their ends are quite close to the surface of the ground, in order that, though the hoppers or receptacles with which they communicate may be filled, material does not flow out therefrom to any considerable extent except as the machine is advanced, when the former produces the sheet or layer D on the roadway; and the latter delivers the fine material E alongside the roadway and in position to be conveniently applied to the surface of the roadway after the layer D has been filled and compacted.

It will be seen by reference to Fig. 2 that the open end of the spout 17 inclines downwardly each way from its center, this formation being adopted in order to give a desired crown to the roadway being produced. If the crusher does not produce broken stone rapidly enough to properly supply the spout 17 as it is being advanced by the tractor, as will be the case unless the apparatus is propelled much more slowly than the ordinary speed of a traction engine, the latter is stopped when the supply from the receptacle 15 is exhausted or nearly so, and remains at rest until the hopper is again filled, when the apparatus is advanced another stage.

It will be seen that the apparatus which I have invented and which is herein described, will operate positively on any grade; and that a road bed with a rock body of any desired thickness may be produced thereby, regardless of the character of rock being employed,—some kinds of which are reduced more rapidly than others by the crusher as is well known,—by reason of the interposition of the storage receptacle 15, where a supply of crushed rock may be accumulated while the apparatus as a whole is standing still and from which the rock is delivered to the roadway and spread in a uniform sheet thereon as soon as the apparatus is advanced.

What I claim is:—

1. A road building apparatus comprising mechanism for crushing rock, means for separating the crushed rock into relatively coarse and fine material, means for delivering the coarse material in a substantially uniform sheet on the road surface as the apparatus is caused to traverse the roadway, and means for delivering the separated fine material laterally to one side of the said sheet of coarse material and in position to be conveniently applied thereto subsequently.

2. A road building apparatus comprising in combination a tractor for rolling and compacting the road surface, a rock crusher, a screen for the product of the rock crusher, means for driving the rock crusher and the screen from the engine of the tractor, a receptacle in which the coarse material from the screen is accumulated, means for delivering the material from the said receptacle and spreading it in a layer as the apparatus is advanced, and means for delivering the fine material from the screen laterally at one side of the layer of coarse material in a position to be conveniently applied to the surface of the latter by hand, the said parts

being connected so as to be propelled as a unitary apparatus by the tractor.

3. A road building apparatus comprising in combination a tractor, a rock crusher, a screen for the product of the rock crusher, means for driving the rock crusher and the screen from the engine of the tractor, a receptacle in which the coarse material from the screen is accumulated, and a spout through which the material from the said receptacle is delivered to the roadway arranged to spread the material in a uniform layer, the spout being adjustable toward and from the surface of the ground, the said parts being connected so as to be propelled as a unitary apparatus by the tractor.

4. A road building apparatus comprising in combination a tractor a rock crusher, a screen for the product of the rock crusher, means for driving the rock crusher and the screen from the engine of the tractor, means for taking the coarse material from the screen and delivering it in a layer upon the road surface, and means extending laterally to one side of the apparatus and arranged to receive the fine material from the screen and deliver it laterally beyond the layer of coarse material, the said parts being connected so as to be propelled as a unitary apparatus by the tractor.

5. A road building apparatus comprising in combination a tractor, a rock crusher, a screen for the product of the rock crusher, means for driving the rock crusher and the screen from the engine of the tractor, a receptacle in which the coarse material from the screen is accumulated, means for delivering the material from the said receptacle and spreading it in a layer as the apparatus is advanced, a jacket surrounding the screen and receiving the fine material therefrom, and a laterally disposed delivery spout for discharging the said fine material at one side of the layer of coarse material, the said parts being connected so as to be propelled as a unitary apparatus by the tractor.

6. A road building apparatus comprising in combination a rock crusher, a rotary screen for the product of the rock crusher in which is arranged a screw conveyer for positively forcing the material through the screen regardless of the grade on which the apparatus may be operating, means for driving the rock crusher and the screen from the engine of the tractor, receptacles in which the coarse material and the fine material, separated from each other by the screen, are respectively stored, and means for delivering the coarse material from its storage receptacle over the road surface being produced, and means for delivering the fine material from its storage receptacle to one side of the roadway.

JAMES D. CLARKSON.