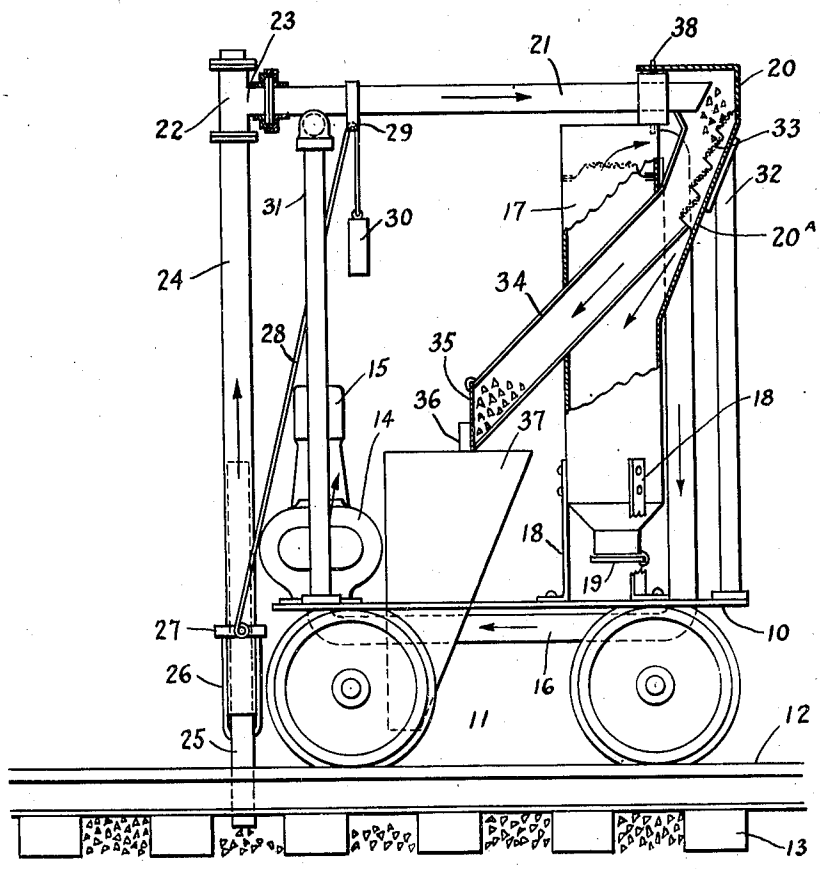
March 9, 1926. 1,576,093

H. G. COOKE

APPARATUS FOR HANDLING RAILROAD BALLAST

Filed Sept. 17, 1921



INVENTOR
Horace S. Cooke
BY
W. B. Hutchinson,
ATTORNEY

Patented Mar. 9, 1926. 1,576,093

UNITED STATES PATENT OFFICE.

HORACE G. COOKE, OF NEW YORK, N. Y.

APPARATUS FOR HANDLING RAILROAD BALLAST.

Application filed September 17, 1921. Serial No. 501,395.

To all whom it may concern:

Be it known that I, HORACE G. COOKE, a citizen of the United States, and a resident of the city, county, and State of New York, have invented a new and useful Improvement in Apparatus for Handling Railroad Ballast, of which the following is a full, clear, and exact description.

My invention relates to improvements in an apparatus for removing, cleaning, and replacing railroad ballast. It has become a practice for good railroads to employ rock ballast, that is a ballast of broken rock or stone for their roadbeds, as this makes a substantial roadbed, and provides necessary drainage. After this ballast has been in use for a time, however, the accumulation of dust, cinders, dirt, and débris of various kinds along the road, fills the interstices of the ballast, thus interfering with drainage, and eventually forms sort of an incrustation over the surface. When the ballast gets in this condition its value is very much impaired, and it has to be taken up, cleaned, the dirt, dust, etc., separated from it, and the ballast replaced. Generally this is a tedious and expensive operation, because it is done most usually with pick and shovel. The object of my invention is to overcome this difficulty, and produce a quick, efficient, and economical way of lifting, removing, cleaning, and replacing the ballast. I have found that if a strong suction of air is applied to the surface of the ballast, it will remove the dirt and dust quickly, and as the finer parts are removed, opportunity is given for the air to get beneath the larger particles of stone, and the whole can be lifted from its bed. In order that this idea can be carried into practice in a convenient and inexpensive way, I preferably mount the apparatus on a movable car, and by choice a light car which can be lifted or otherwise removed readily from the track so as not to interfere with the ordinary traffic. I provide an exhaust fan, means, as for instance a gas engine, to operate it, and a suction pipe which can be directed upon the roadbed, and the fan will draw the particles through the pipe. The pipe delivers over a series of screens which separates the dirt and dust therefrom, and the cleaned ballast is deposited in the hopper and re-directed upon a desired place in the roadbed. This idea works out very efficiently in cleaning the track proper, as the ballast can be lifted from between the ties, cleaned, and the cleaned ballast redeposited between ties from which the ballast has already been removed.

In carrying out the idea, the suction pipe should be more or less flexible, and can be extensible so as to easily come in contact with the track surface, and it can be made to turn round so as to fit between the tracks, and thus the entire ballast of the roadbed can be removed. My invention permits of many modifications of structure, as will be understood from the description which follows.

Reference is to be had to the accompanying drawing forming a part of this specification in which similar reference characters indicate corresponding parts in the view.

The figure is a broken side elevation partly in section showing how my invention can be carried into effect.

The drawing is by way of example, and shows a simple apparatus for carrying out my invention, and from the accompanying description it will be seen that the details of much of the structure are not important, but I have shown an apparatus which is efficient and does the work well.

The apparatus is preferably mounted on a base 10 which can be a platform of a light car 11 running on the track rails 12 which are supported in the usual way upon the ties 13, and between the ties and between the tracks the ballast is distributed as usual.

The apparatus is provided with an exhaust fan 14 which should be a powerful fan or suction apparatus, and can be of any approved type, and this can be driven in any preferred manner, as for instance by a gas engine 15 mounted on the car. I have not shown the connection between the two, as this is unimportant, and any suitable connection can be made between the engine or motor and the exhauster 14.

From the exhauster 14 leads a suction

pipe 16 which connects with the upper part of the bin 17, this being air tight and for the purpose of collecting dirt, dust, and fine particles, as presently described. The bin can be of any suitable construction, and I have shown it supported by standards 18 attached to the platform 10. The bin has a suitable tight closing lid 19 at the bottom which can be opened when the contents of the bin are to be removed. Adjacent to the bin and preferably slightly above it, is a box 20, one wall of which is inclined as shown at 20a so that the box will discharge into the bin, and delivering into the box is a pipe 21 which has an air tight connection with the box, and which preferably extends in a horizontal direction connecting by a T 22 with the vertical pipe 24 at one end of the car. The pipe 22 has a swivel connection as shown at 23 with the pipe 21, so that the pipe 24 can be swung laterally in order that its lower extension or mouth can be brought into contact with the track bed at all points. To facilitate this arrangement the pipe 24 should be flexible or should have an extensible portion, and I have shown it with an extensible lower end 25 which slides in the pipe and is connected by arms 26 with a collar 27 sliding on the pipe 24, and connected with a cable 28 which runs over a guide 29 on the pipe 21 and attached to a counter-balancing weight 30, so that the lower end 25 of the pipe 24 can be easily raised and lowered and brought into intimate contact with the full width of the track bed.

Obviously the essential thing is to have the suction pipe sufficiently flexible to enable the above arrangement to be carried out, and the invention is not confined to the particular means shown. As illustrated, however, it will be seen that the suction from the fan 14 will cause the material at the mouth of the pipe 24 to be raised through said pipe, passed through the pipe 21, and delivered into the box 20. The pipe 21, box 20, and adjacent apparatus can be supported in any convenient way, as for instance by the framework 31 and 32.

Within the box 20 and between it and the inclined wall 20a are a series of screens 33, and the material discharged from the pipe 21 drops upon these screens so that the fine parts will pass through and be collected in the bin 17, while the coarser parts will pass over the screen and through the chute 34 which extends from the box 20, and is shown passing through the walls of the bin 17, although it can be differently arranged if desired. The lower end of the chute 34 has a lid 35 which closes tight against the end of the chute, and is normally held closed by a weight 36. When sufficient ballast has collected in the chute, however, to overcome the weight, the lid swings open, and the ballast drops into the hopper 37, which as illustrated, delivers between two of the track ties 13. Thus it will be seen that the suction from the fan 14 will lift the ballast from between the ties 13 and discharge it upon the screens 33, separate the finer from the coarser parts, and deliver the cleaned broken rock into the hopper 37, from which it will drop into a space from which the material had previously been removed, and consequently as the car 10 progresses, the apparatus lifts the ballast from between one set of ties and automatically deposits the clean ballast between another set.

In order that the apparatus may clean the space between the tracks, the pipe 21 can be pivoted near where it enters the box 20, as shown at 38. I have shown a conventional pivoting arrangement, but any suitable device can be used for the purpose. This arrangement permits the pipes 21 and 24 to swing around laterally so as to cover the said space, and thus the whole ballast of the road bed can be raised, cleaned, and re-deposited.

From the foregoing description it will be readily seen that the work of removing, cleaning, and replacing the ballast can be very efficiently and quickly carried on, and it will be understood that if it is not desired to lift the whole bed of ballast, enough suction can be applied to remove the top accumulation of refuse, dirt, etc., leaving the rest of the bed substantially clean, or if it is necessary, the whole mass can be lifted, cleaned, and replaced as described. I have found that this can be very readily done because the finer particles lift readily by suction, and after these are removed, the air gets beneath the particles of rock because of their irregular shape, and they are then lifted quite readily.

It will be understood that this apparatus can be changed in detail, and can be made heavy and mounted on a heavy platform car, but I prefer to mount it on a car which is light enough so that it can be quickly removed from the track to accommodate the ordinary traffic.

In the drawings I have shown the hopper 37 delivering between the ties 13, but it will of course be understood that this hopper, with the chute 34, can be arranged to deliver the cleaned ballast at the sides of the track, or at any desired point within the limits of the apparatus.

I have shown and described my apparatus as being mounted on a car and movable along the railway track, which is the preferred arrangement of the structure; but it will be understood that the apparatus might be mounted in a stationary or semi-stationary manner at a desired place along the track, and the exhaust pipe made longer, and thus the apparatus would work as al-

ready described, but over a larger radius without moving it as a whole.

I claim:—

An apparatus of the kind described comprising a car, a suction pipe supported on the car and constructed to have its mouth brought adjacent to the roadbed of the track, means for creating a suction in the pipe, a hopper to receive the material discharged from the pipe, and a screen in the path of the material in the pipe to screen out the finer parts thereof.

HORACE G. COOKE.