

(No Model.)

M. F. FIELD.
SANDING DEVICE FOR RAILWAY CARS.

No. 505,976.

Patented Oct. 3, 1893.

Fig. 1.

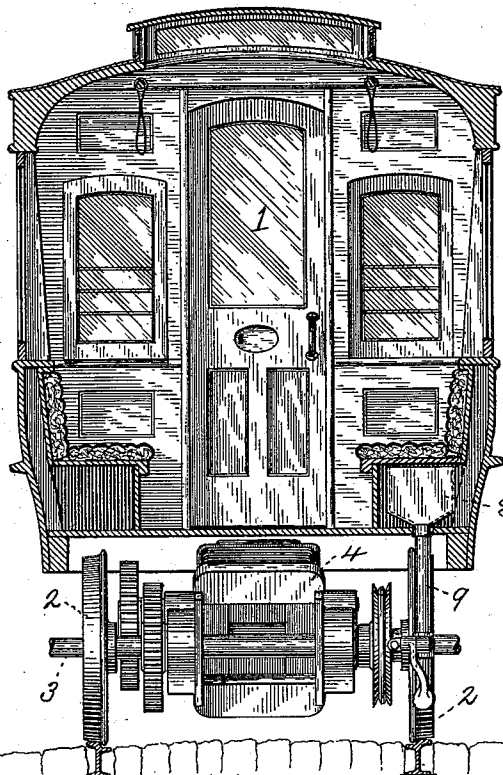


Fig. 4.

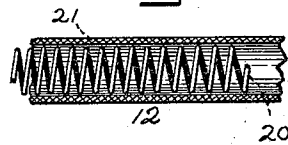


Fig. 2.

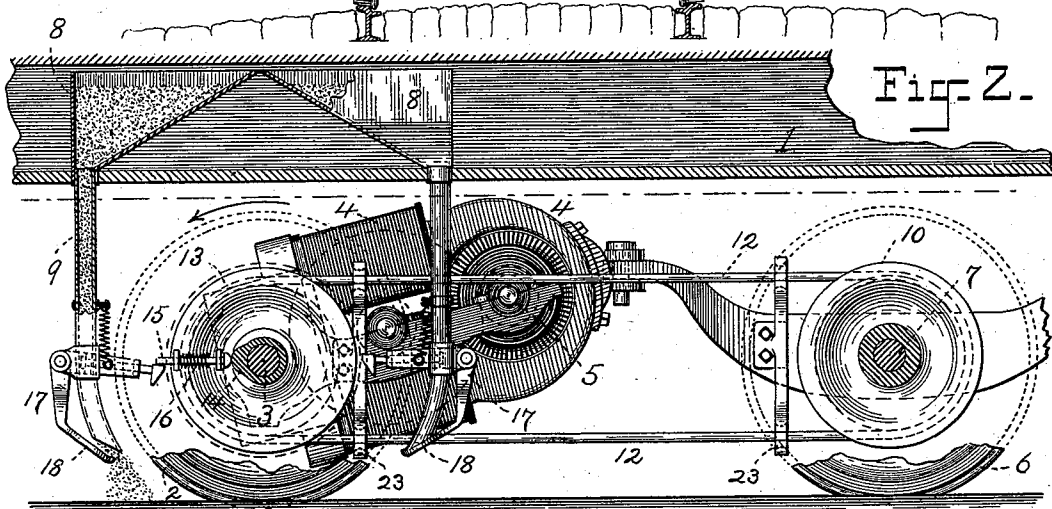
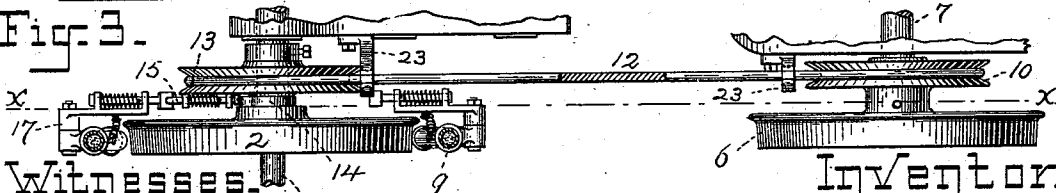


Fig. 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

MILLARD F. FIELD, OF TAUNTON, MASSACHUSETTS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE AUTOMATIC RAILWAY TRACK SANDER COMPANY, OF MAINE.

SANDING DEVICE FOR RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 505,976, dated October 3, 1893.

Application filed January 21, 1893. Serial No. 459,147. (No model.)

To all whom it may concern:

Be it known that I, MILLARD F. FIELD, a citizen of the United States, residing at Taunton, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Sanding Devices for Railway-Cars; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to sanding devices, which are employed to deliver sand upon the rails of any railway system, more particularly street-car systems, at such times when increased friction is required between the drive-wheels and the track, and ordinarily needed when slip occurs due to lack of proper friction.

My invention is embodied in mechanism by which the sanding device is operated automatically, whenever slip occurs, and such elements as are employed are entirely independent of the engineer or motor-man.

My improvements are especially adapted for electric cars.

The principle of my invention is based upon the differential rates of speed, when such exist between the drive-wheels and any trail wheel. By trail-wheel I mean to designate any supporting wheel not connected directly to the motor.

The gist of my invention briefly stated is embodied in a cam fast upon the motor-shaft, a drum loose upon the same shaft and furnished with valve operating mechanism, together with a drum fast upon a trail shaft, and a band which unites the said drums. Thus the two drums always revolve at equal rates of speed, while the cam travels at varying rates of speed therefrom. In this way it serves to operate the valve mechanism on the loose drum and may be made to actuate valves which control the sand-boxes at such times, as when slip occurs, and likewise when the brakes are set.

The drawings accompanying this specifica-

tion represent in Figure 1. a transverse sectional elevation of a street-car containing my invention. Fig. 2. is a sectional side elevation of the running gear in part of a street car equipped with a sanding device embodying my invention. Fig. 3 is a fragmentary plan of two wheels of a street car, the line x indicating the section illustrated in Fig. 2. Fig. 4 is a fragmentary view in sectional elevation longitudinally of an elastic driving band.

In said drawings 1. represents a fragmentary portion of a six-wheeled car adapted for electric street service, the drive-wheel being shown at 2, its shaft at 3; the motor in diagram at 4, the motor-shaft at 5, while the trail-wheel or supporting wheel operated by rolling friction only is illustrated at 6 with its shaft at 7. The sand boxes are shown at 8 preferably placed beneath the car-seats, and the discharge ducts or spouts are at 9.

To render the delivery of sand from the latter entirely automatic and to cause such act—viz: the sanding of the rails—to occur only at certain desired times, when the drive-wheels are slipping, or when the car must be stopped quickly by setting of the brakes, I provide the following mechanism. Upon the trail-shaft 7 is mounted a drum or pulley 10 fast to the shaft and preferably grooved in order to receive a band or flexible connection 12, which unites said drum with a similar drum 13 of equal diameter, but loosely mounted upon the drive shaft 5. Thus it is intended that both said drums should always maintain the same relative speed, the size of these drums being immaterial to the gist of the invention. Furthermore affixed upon the drive-shaft is a cam 14, while on the loose drum is located valve operating mechanism. In the present instance it consists of a reciprocating rod or plunger 15 held normally in an idle position by the spring 16, while it is rendered active or thrust out against the tension of said spring at certain specified times. Activity of this plunger takes place, when slip occurs or should the brakes be set; in the first instance it will be understood that the drive-wheels at once increase their speed, but the trail-wheels continue at the normal rate of

rotation. As a result the shaft 5 with its accelerated movement causes the cam to overtake the plunger 15 forcing it outwardly, and as the latter revolves it engages the valve-lever

17. The latter is preferably a spring-actuated bell-crank lever pivoted upon a collar secured to a sand spout. The vertical arm of this lever is equipped with a valve or gate 18, which closes the delivery end of the spout. Conversely when the brakes are set, as for instance on a trail-wheel the latter is retarded in its rotation, while the motor-shaft traveling at a higher rate of speed again overtakes the plunger 15 which is thrust forward by the cam and the valve 18 is operated to allow sand to be scattered upon the rail.

In the attachment of this device to street cars, more particularly electric-cars fitted with four-wheeled trucks, I find it necessary to employ an elastic band shown enlarged in Fig. 4. This band may consist of a solid rubber band or it may be composed of a coiled spring 20 contained within a rubber or other elastic exterior covering 21, in order that it may lengthen, as the car rounds sharp curves. Otherwise the swinging movement of the truck would break the band if the latter could not yield.

I do not desire to be limited to any precise or exact mechanism for operating the valve to cause delivery of the sand, nor to the particular mode of connecting the loose disk to cause it to rotate at uniform speed with a similar disk on a trail-shaft, since I consider the gist of my invention is embodied in the method of automatically operating a sanding device by making use of the differential rate of speed which occurs between the drive-wheel and trail-wheel at certain times.

In the drawings the sand discharge spouts are shown as duplicated in order to provide for sanding of the rails whichever end of the car is employed as the front one. Thus the horizontal end or nose of the valve-lever is obliquely inclined on the rear side, in order that the plunger may wipe by it easily, when rotating in one direction, but shall engage and operate it if moving in the opposite direction. Thus if the drive-wheels are rotating in the direction of the arrow and slip occurs, the more rapid rotations of the drive-wheels cause the shaft 5 with its cam 14 to overtake and engage the plunger 15 thrusting it forward, but

said plunger having rotation of its own produced by the trail-wheels wipes against and depresses the nose of the valve lever; this act causes a discharge of sand by opening the valve for a short interval. The valve is thus actuated repeatedly and rapidly so long as the differential rate of rotation exists between the drive and trail wheels.

In order to prevent the band from being unshipped when a car rounds a sharp curve guides 23 are furnished, these latter being suitably mounted and attached to the truck frame.

What I claim is—

1. The combination with a drive-wheel, and a trail-wheel, of a sanding device, together with means for operating said sanding device automatically when a differential rate of movement occurs between said drive-wheel and trail-wheel, substantially as explained.

2. The combination with a drive-wheel, a trail-wheel, their respective shafts, and a sanding device, of two drums, one fast on the trail-shaft, the other loose on the drive-shaft, a band connecting said drums, and mechanism operated by the differential rate of speed between the drive and trail-wheels to automatically control said sanding device, substantially as hereinafter specified.

3. In combination with a drive-shaft, a trail-shaft, two drums respectively loose and fast upon said shafts, and a band connecting the said drums, a cam affixed upon the drive-shaft, a sanding device, and mechanism carried by the loose drum to actuate a valve upon a sanding device, substantially as set forth and stated.

4. The combination with a sanding device, a duct therefrom, and a valve and valve-lever to control the sand discharge, of a loose disk upon a drive-shaft, a spring-actuated plunger carried by said disk, a cam fast upon the drive-shaft to actuate said plunger, together with means for operating the loose disk by a supporting wheel, which has rotary movement independent of the drive wheel, substantially for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

MILLARD F. FIELD.

Witnesses:

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