

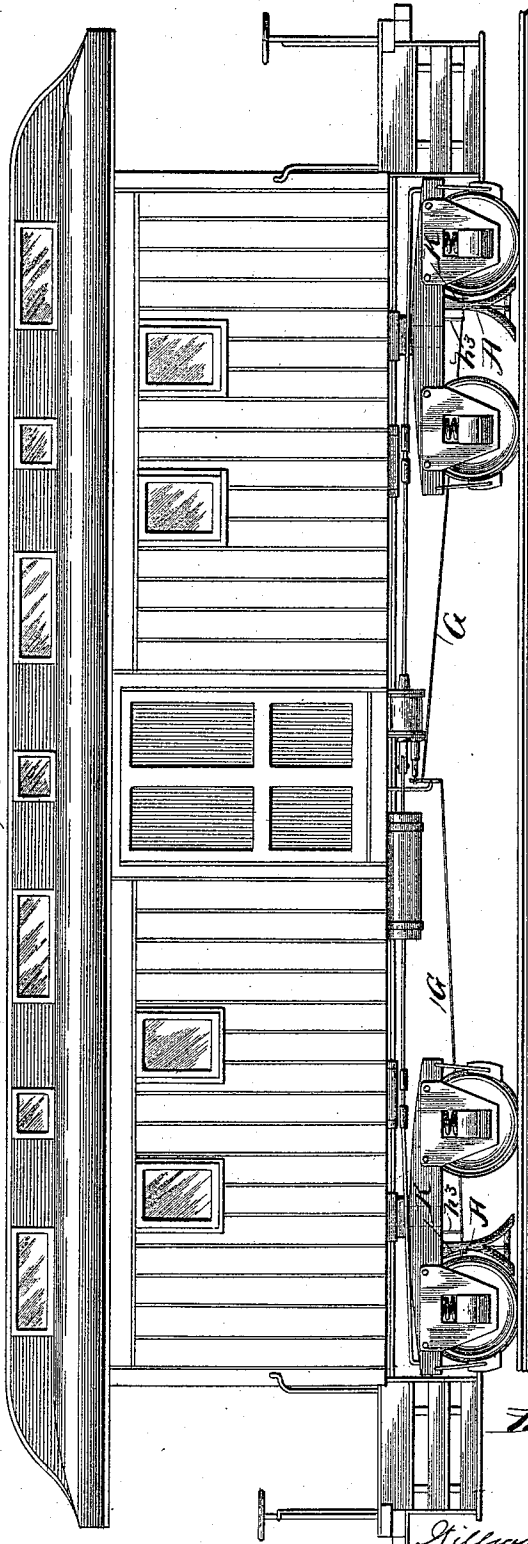
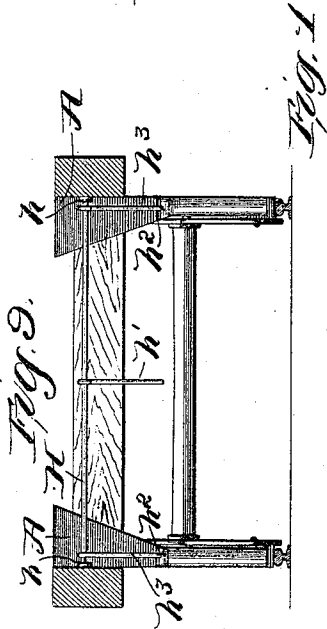
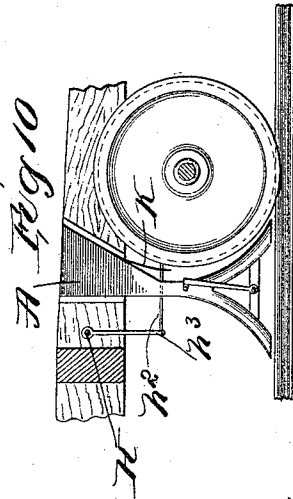
(No Model.)

3 Sheets—Sheet 1.

W. B. LEITCH.
SANDING DEVICE FOR RAILWAY CARS.

No. 485,703.

Patented Nov. 8, 1892.



Witnesses
Wm. Hill.
J. L. Rice

Inventor
William B. Leitch
By L. Rice his Att'y

(No Model.)

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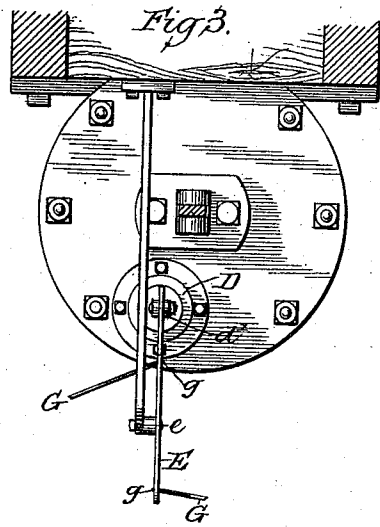
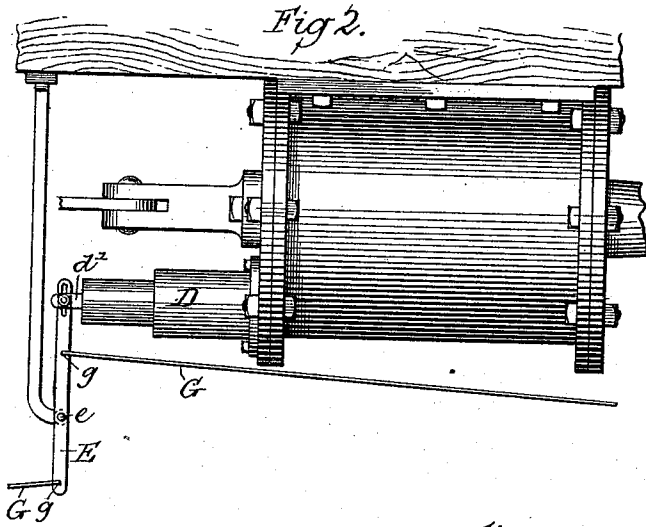


Fig. 4.

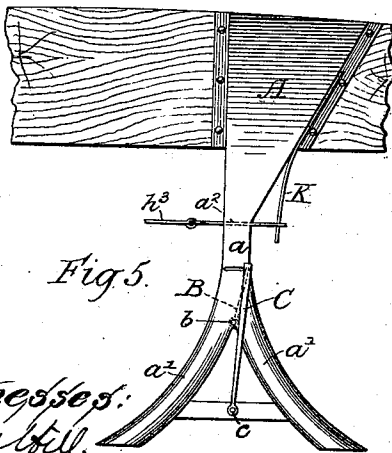
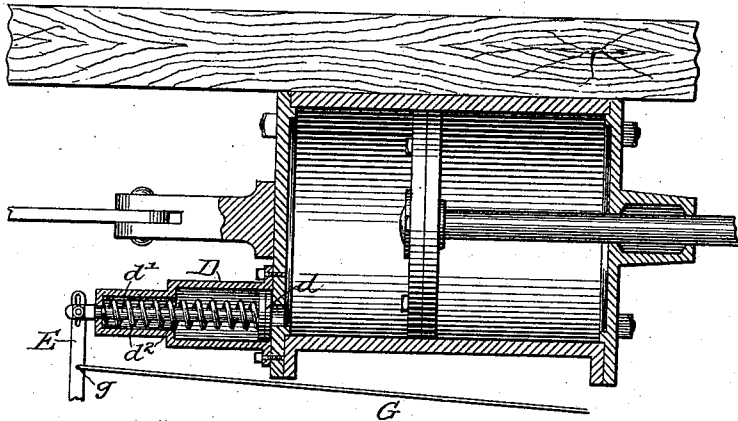


Fig. 5.

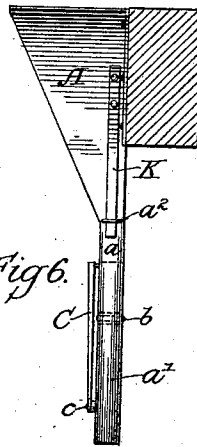


Fig. 6.

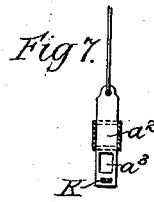


Fig. 7.



Fig. 8.

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(No Model.)

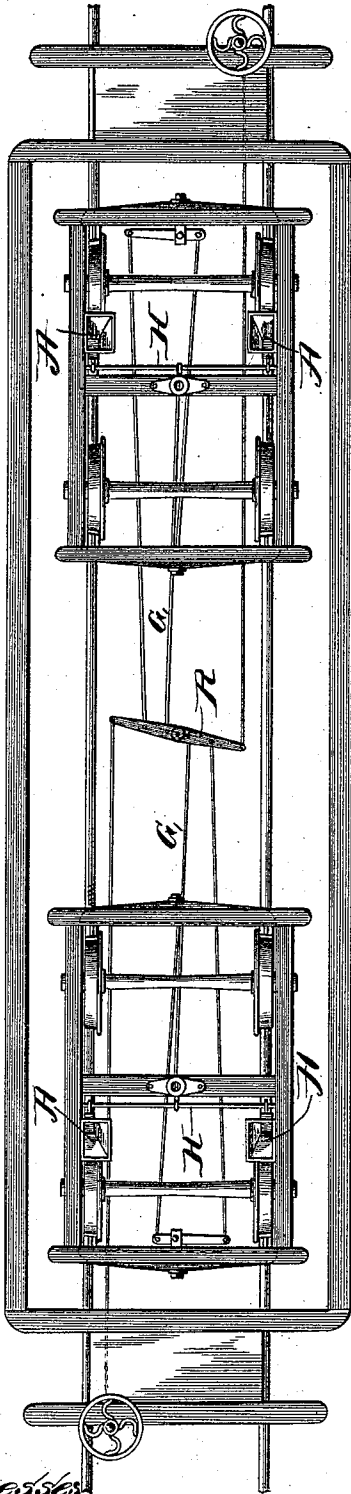
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Fig. 11.



Witnesses
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Fig. 12.

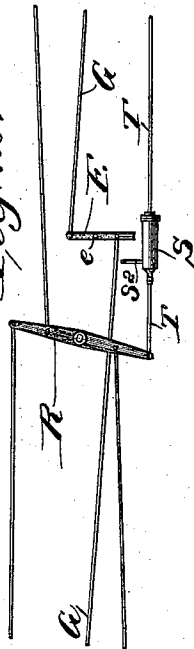


Fig. 14.

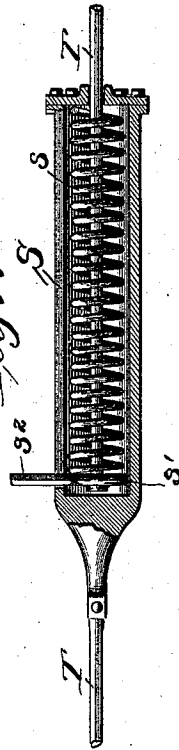
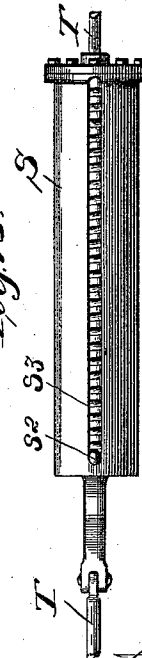


Fig. 13.



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UNITED STATES PATENT OFFICE.

WILLIAM B. LEITCH, OF ALLERTON, IOWA.

SANDING DEVICE FOR RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 485,703, dated November 8, 1892.

Application filed February 4, 1892. Serial No. 420,356. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. LEITCH, a citizen of the United States of America, residing at Allerton, in the county of Wayne and State of Iowa, have invented a certain new and useful Improved Sanding Device for Railway-Cars, of which the following is a specification.

Referring to the accompanying drawings, wherein like reference-letters indicate like parts, Figure 1 is a side elevation of a car equipped with my improvement. Fig. 2 is a top plan, Fig. 3 an end view, and Fig. 4 a horizontal section, of an air-brake brake-cylinder adapted to operate my device. Figs. 5, 6, 7, and 8 are detail views of the sand-box and its valves and pipes. Figs. 9, 10, and 11 are details of the device by which the operating-rod is connected to the sand-valves; and Figs. 12, 13, and 14 are detail views of an emergency operating device for wheel-brakes.

The main principle of my invention consists in causing the setting of the brakes to automatically apply sand or similar material to the rail beneath a running car or similar construction, while a subordinate principle consists in only so applying the sand when the emergency-stop is applied.

In accomplishing this I place a sand-box A on each end of the trucks, preferably between the two wheels. At the bottom of the sand-box and forming a continuation of the same I place a pipe a , the lower or distributing end of which lies close to and directly over the upper surface of the rail. In the pipe a I arrange a valve a^2 , which may be of any desired form that will operate effectually to control the release of the sand. I prefer to use the horizontal sliding valve shown in Figs. 5, 6, 7, and 10.

To operate the valve a^2 , I employ the following mechanism: Near to and supported by the truck-frame I arrange the rock-shaft H, supported transversely across the car in any satisfactory manner, as by bearings h h . From any point on the said rock-shaft, preferably the center, I extend the arm h' at right angles to said shaft H, while near the ends of said shaft, preferably in line with the valves a^2 , similar arms h^2 h^2 are placed. The ends

of the arms h^2 h^2 are connected with the valves a^2 a^2 in any satisfactory manner, as by rods h^3 h^3 , and the end of the arm h' is connected to a rod or other part operated by the brake mechanism.

If it be deemed necessary, I may arrange a spring to assist in the positive closing of the valve a^2 when the strain is removed from the opening mechanism. In this I prefer to use the spring K. (Shown in Figs. 5 and 6.)

The mode of operation is as follows: When the brake is applied, the brake mechanism by means of the rod G swings the arm h' , thus rocking the rock-shaft H and swinging the arms h^2 h^2 , thus actuating the rods h^3 h^3 and sliding the valves a^2 a^2 and releasing the sand, which is conducted by the pipe a to the rail, as set forth. When the brake is released, the action is reversed, the spring K assisting to insure the perfect closing of the valve.

With the ordinary air-brake systems I prefer that the sand-valves shall be operated only in connection with the making of an emergency or similar stop, and in that form I preferably use the following mechanism: Attached to the air-brake brake-cylinder and communicating therewith I place a secondary cylinder D, Figs. 2, 3, and 4. In the cylinder D and operated by the force of the compressed air in the brake-cylinder is placed the piston-head d , attached to and actuating the piston-rod d' , the free end of which is attached to and controls a lever E, which is fulcrumed at e . In the cylinder D and arranged to act against the piston-head d to normally hold the same inactive and near the brake-cylinder I place a spring, preferably the coiled spring d^2 . The cylinder D may, if desired, be made of two different-sized bores, as in Fig. 4, in the smaller part of which the spring d^2 may be compressed when in operation, the shoulder thus formed also acting as a stop, limiting the distance the piston may move. Connected to the lever E on opposite sides of the fulcrum e , I arrange the rods G G, the free ends of which are connected to the arms h' h' , before described. The spring d^2 is of such resistance that the ordinary pressure used in operating the brakes will not com-

press it; but upon the pressure termed the "emergency" pressure being applied it will act freely, and thus serve the end designed at a time most necessary. To accomplish this, the spring d^2 should press the piston d to its seat with a pressure sufficient to prevent the release of the sand when the brakes are applied with the ordinary force, but to release the sand whenever the pressure is such as to probably slip or slide the car-wheels upon the rails. Ordinarily a pressure of from thirty-five to forty pounds to the square inch in the brake-cylinder is sufficient to lock the wheels of a light or empty car, and the spring d^2 should be of such resistance as to release the sand upon the rail just before such a point is reached, and thus prevent the sliding of the wheels upon the rail. It is obvious that upon the pressure being applied in the brake-cylinder above described the piston d will be actuated, the spring d^2 compressed, the lever E and the connecting-rods G G operated, and the rock-shaft rocked, as before described.

As an independent improvement the device shown in Figs. 12, 13, and 14 may be employed to apply what may be termed an "emergency force" when the ordinary brake system is used, and in such case the sand be released only when the extreme or emergency force is applied. In this device, which constitutes a spring coupling or joint in the brake-rod, the case S incloses the spring s , a part of the brake-rod T extends into said case at one end and through said spring, and is at the other end of the case attached to the transverse head s' . Extending through the longitudinal slot s^3 in the case S and adapted to move backward and forward along the same is the projecting pin s^2 . The end of the case S opposite to that which the rod T enters is attached to the continuation of said rod T , the device thus serving to connect the two parts of the brake-rod together. The device is so located with reference to the lever E that when the pin s^2 is moved along the slot s^3 a certain distance it will engage with and operate said lever, and upon release will return to its original position, the mode of operation being as follows: As the brakes are set ordinarily the spring s is of such resistance as not to be contracted between the head s' and the end of the case; but when a special necessity arises to make a quick stop further force contracts the spring s , and the pin s^2 , moving along the slot s^3 , engages the lever E and operates the sand-valves, as before set forth.

As a further independent improvement the pipe a may be branched at its lower end into two parts a' a' , extended backward and forward, as shown in Figs. 5, 6, 7, and 8. At the intersection of the lower surfaces of the pipes a' a' I pivot the deflector B , which extends upward. The deflector is so poised that upon the retarding of the car the momentum will

carry the top of the deflector forward against the wall of the pipe a , thus deflecting the sand into the remaining open branch a' and delivering it in a direction opposite to that in which the car is running. If it be found that the deflector B requires aid in the above-described action, the vertical bar C , pivoted at its lower end, may be used to aid such action, the deflector B being connected to the same in any desired manner, as by a slot and pin acting therein, the bar C and deflector B thus acting in unison. In such case the top of the bar C may, if desired, be weighted to add to the momentum gained.

I do not wish to limit myself to the specific mechanism herein shown, as it is evident that numerous equivalents may be employed to accomplish the same results, the broad idea of my invention being, as I before stated, the automatic sanding of the track by the setting of the brakes.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with a brake system upon a car or locomotive, a sand-box so arranged as to automatically release the sand and conduct the same to the rail upon the setting of the brakes with a certain force, but not to so release it when the brakes are set with any less force, substantially as and for the purposes set forth.

2. In combination with an air-brake system of a car or similar construction and the automatically-operated sand-box described, the supplementary cylinder D , containing the spring-piston d , adapted to operate the sand-valves by means of intermediate connecting mechanism, substantially as set forth.

3. In an automatic sanding device, the combination of the sand-box A and its valve a^2 and conducting-pipe a' with the rock-shaft H , having the arms h' h^2 h^3 , said arm h' being operated by the brake mechanism and the arms h^2 h^3 being connected to and adapted to operate the valves a^2 a^2 , substantially as set forth.

4. In combination with the brake system of a car or similar construction, the herein-described sand-box and its operating mechanism, so connected to the brake mechanism by a spring connection as to be operated by the application of the brakes with a certain force, but not to be so operated by the application of the brakes with any less force, substantially as set forth.

5. In an automatic sanding device, the combination of the sand-box A , pipe a , valve a^2 , and spring K with the rock-shaft H , arms h' h^2 h^3 , rods h^3 h^3 , and the brake mechanism of the car, substantially as set forth.

6. In an automatic sanding device, the combination of the sand-box A , pipe a , valve a^2 , spring K , rock-shaft H , arms h' h^2 h^3 , and rod

h^3 with the rods G, lever E, piston-rod d' , and its operating mechanism, substantially as set forth.

5 7. In an automatic sanding device for rail-way-cars, the combination of the sand-box A and valve a^2 with the pipe a , branch pipes a' a' , and deflector B, substantially as set forth.

8. In an automatic sanding device for rail-

way-cars, the combination of the sand-box A and valve a^2 with the pipe a , branch pipes a' a' , deflector B, and bar C, substantially as set forth.

WILLIAM B. LEITCH.

In presence of—

JOHN MCCANDLESS,

JOHN W. HILL.