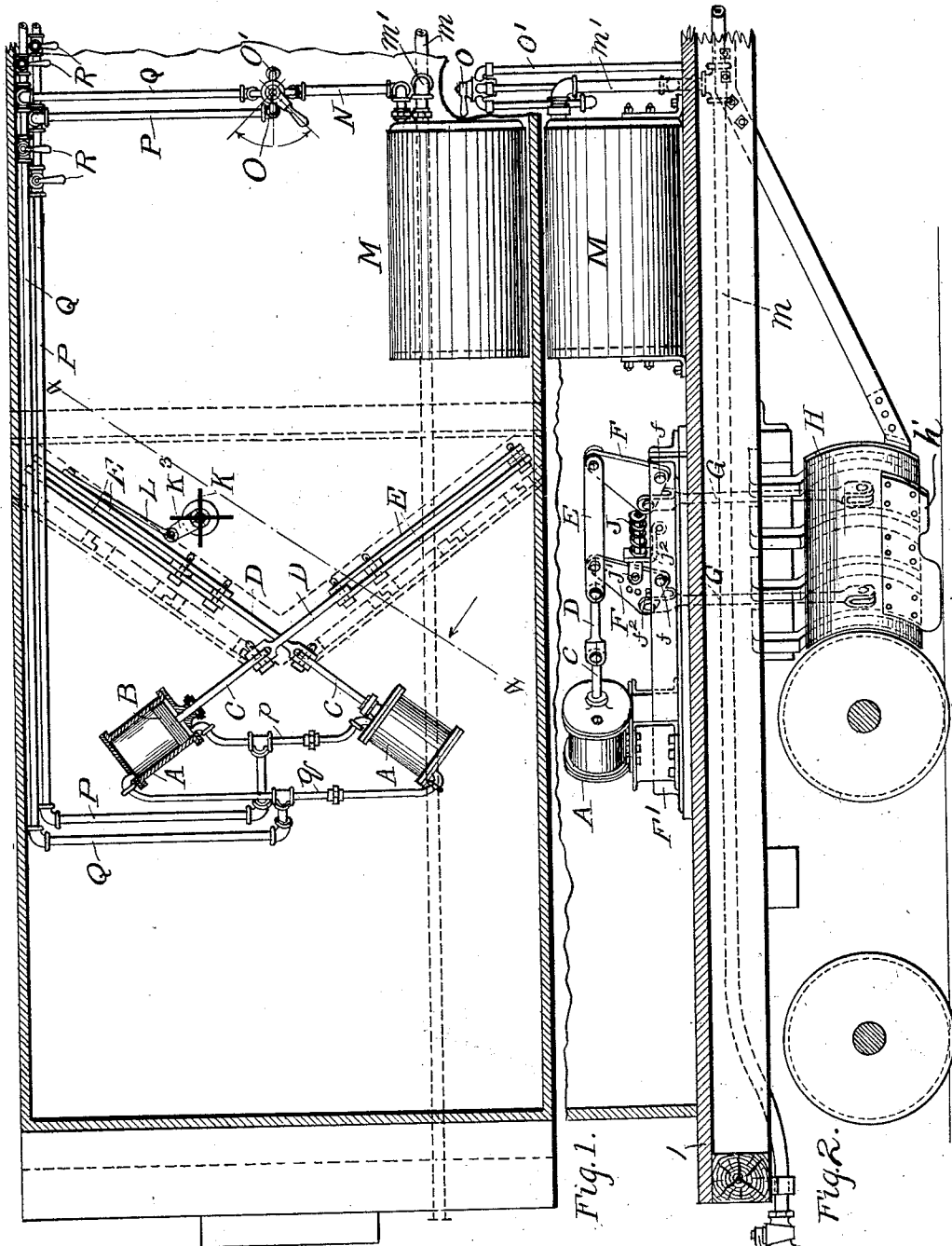


1,065,453.



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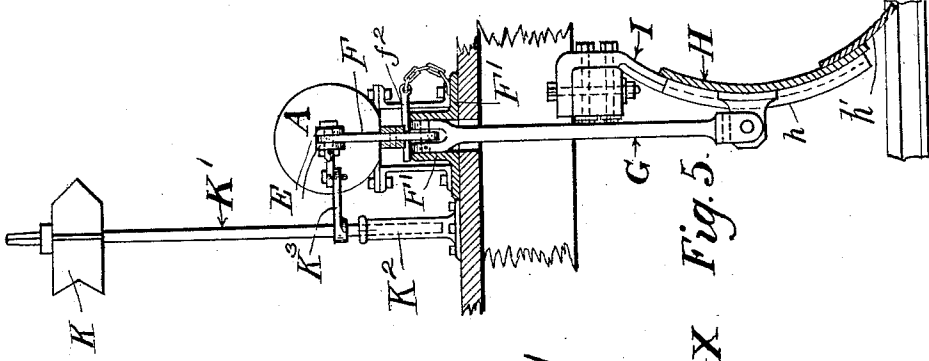


Fig. 5.

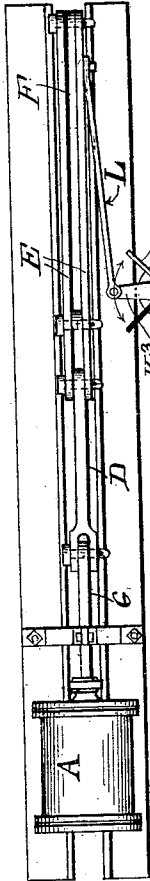


Fig. 3.

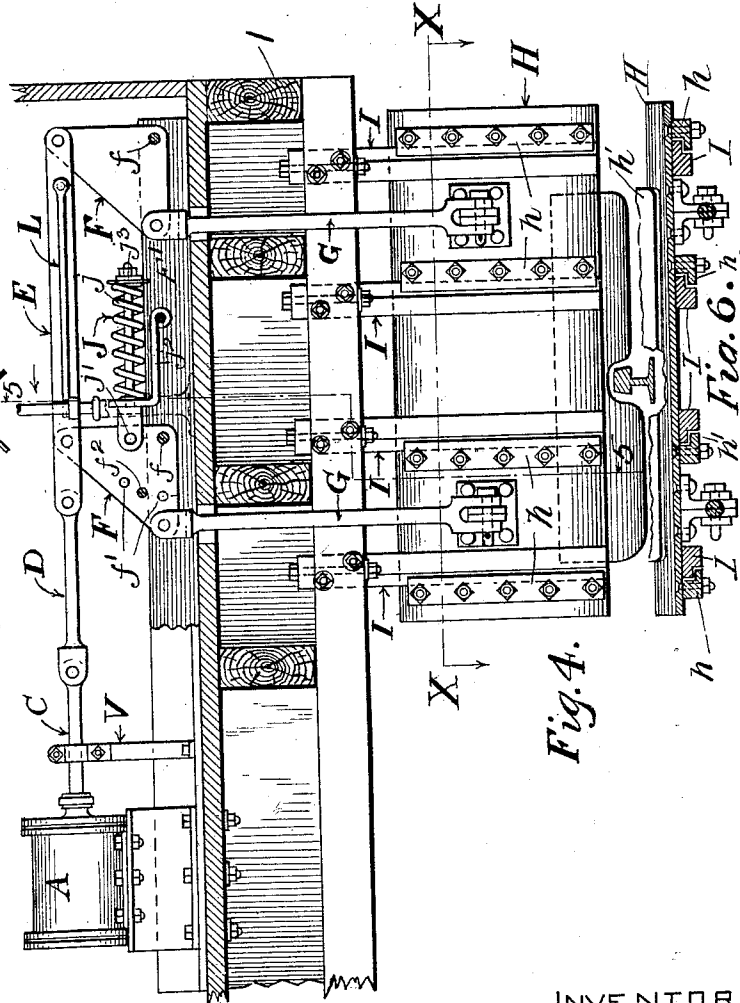


Fig. 4.

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BENJAMIN F. LAWRENCE, OF BUFFALO, NEW YORK.

SNOW AND ICE FLANGER.

1,065,453.

Specification of Letters Patent.

Patented June 24, 1913.

Application filed July 1, 1912. Serial No. 706,929.

To all whom it may concern:

Be it known that I, BENJAMIN F. LAWRENCE, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Snow and Ice Flangers, of which the following is a specification.

This invention relates to the class of track clearers commonly known as snow and ice flangers, and more particularly flangers which are arranged obliquely underneath a suitable railway vehicle and raised and lowered by means of compressed air cylinders and pistons.

The main object of my invention is to construct the flanger-blade in such manner that in case it should accidentally meet with an obstruction, such as a frog or crossing, it will be free to yield or recede on its supports before doing any damage to itself or the track.

Further objects are to improve the apparatus in other respects, with a view of reducing its cost and increasing its durability; and to combine with the flanger a visual indicator of simple construction by which the engineer may be apprised at all times of the position of the flanger, whether raised or lowered.

In the accompanying drawings consisting of 2 sheets: Figure 1 is a fragmentary horizontal section of a railway car equipped with the flanger. Fig. 2 is a fragmentary vertical longitudinal section thereof, showing the flanger blades elevated. Fig. 3 is an enlarged top plan view of the actuating mechanism of one of the flanger blades and the indicator connected therewith. Fig. 4 is an enlarged transverse section on line 4-4, Fig. 1. Fig. 5 is a vertical section on line 5-5, Fig. 4. Fig. 6 is a horizontal section on line X-X, Fig. 4.

Similar characters of reference indicate corresponding parts throughout the several views.

The flangers or flanger-blades and their raising and lowering mechanism are preferably mounted upon a car 1 of any suitable construction.

Underneath the car body, near the end thereof, is arranged a pair of forwardly-converging scrapers, flangers or flanger-blades H of steel or other suitable material. A single pair of such blades is shown in the drawings, but in practice they are prefer-

ably duplicated in the reverse position near the opposite end of the car, so that the car may be run in either direction.

The flanger blades are curved vertically from top to bottom, so that when lowered to their operative position they pass under the snow and ice with a plow-like action, lifting and clearing the same from the track. Each blade is mounted to slide in a substantially vertical direction upon curved or curvilinear guides I suitably secured to the car frame, the blade being for this purpose provided on its rear side with correspondingly curved retaining or guide-flanges h which embrace said guides, as best shown in Figs. 4 and 6. The blade and its guide flanges are curved concentrically with the guides I, so that if the blade, when lowered, should strike a frog, crossing or other obstruction, its lower edge is free to recede rearwardly and upwardly to clear the obstruction and descend to its normal position after passing the same. Each blade preferably has a separate flanger tip h¹ which can be replaced by a new one when worn out, obviating the necessity of renewing the entire blade.

The blades may be raised and lowered by any suitable means, but I preferably employ the pneumatic mechanism shown in the drawings and constructed as follows: A indicates a horizontal pressure cylinder arranged in line with the corresponding diagonal flanger blade and containing a piston B, the rod C of which is connected with the upper arms of a pair of bell cranks F by links D and E. The bell cranks are pivoted at f between a pair of angle bars F¹ secured to the floor of the car, and the rear side of the flanger-blade is connected with the lower arms of the bell cranks by lifting rods or links G. M indicates a compressed air reservoir mounted on the car and preferably supplied from the usual train or air-brake pipe m by a branch pipe m¹. N indicates a pipe leading from said reservoir to a four-way valve O and P and Q indicate pressure pipes connected with said valve in such manner that compressed air may be alternately admitted to opposite ends of the pressure cylinders A by turning the valve into different positions. The inner ends of the pressure cylinders are connected with one of these pipes, say the pipe P, by branch pipes p, while the opposite ends of the cylinders are connected with the pipe Q by branch pipes q. The valve O also has an

exhaust port or branch O^1 through which the air is exhausted from either end of the cylinders. Two pairs of cut off valves R are preferably arranged in the pressure pipes P, Q, so that pressure may be supplied to the two sets of cylinders at either end of the car.

Suitable safety or positive locking means are preferably provided for supporting the flanger-blades at different elevations and preventing them from dropping upon the track when the air pressure is off or in case of leakage. In the construction shown, one of each pair of bell cranks F is provided with a substantially upright series of openings f^1 , say three, in any one of which a locking pin f^2 may be inserted, this pin resting normally upon the angle bars F^1 . These openings are so arranged that when the pin f^2 is inserted in the uppermost one, the descent of the blade is limited to its flanging position. When the pin is placed in the intermediate opening, as shown in Fig. 4, it supports the blade at the proper height for leveling ballast; while when the pin is placed in the lowermost opening, the blade is supported in its highest or inoperative position, clear of all objects, for running the car from place to place.

A suitable cushion J is preferably combined with the blade operating devices to ease the fall of the blades and prevent shearing of the safety pin f^2 by its impact against the angle bars F^1 . This cushion may consist of a spiral spring applied to a sliding rod j pivoted at j^1 to one of the bell cranks F. This rod slides in a bracket j^2 secured to the angle bars F^1 , and the spring J is interposed between said bracket and a collar j^3 secured to the rod, thus resisting the descent of the flanger-blades and protecting the safety pin from shearing or breakage which might otherwise occur. This spring also aids in elevating the flanger-blades.

A telltale or visual indicator of simple construction is preferably associated with the flanger-blades to indicate their position to the engineer, as a precaution for preventing accident or injury to the parts or the track, when approaching switches, crossings &c. This indicator preferably consists of a target K mounted on a rotary spindle K^1 supported in a standard K^2 . This spindle has an actuating arm K^3 connected by a rod or pitman L with a part of the connection between the pressure cylinders A and the flanger-blades. Preferably, said pitman is connected with the link E and the parts are so proportioned, that the spindle receives a quarter-turn in one or the other direction by the movements of the pistons B. The target shown in the drawings consists of two plates fixed to the spindle at right angles to each other and painted in different colors, say one in red, to indicate that the flanger-blades

are in their lowered position, and the other in white to indicate that they are elevated to a safe position to pass freely over switches, crossings, etc.

The operation of the apparatus is as follows: When it is desired to lower the blades to their flanging position, the locking pins f^2 are placed in the uppermost openings of the bell cranks F and the four-way valve O is turned to the proper position to admit compressed air on the front side of the pistons B. The latter thereupon swing the bell cranks toward the pressure cylinders K against the resistance of the spring J, causing the blades to slide down on their curved guides I. The blades are yieldingly held down in their working position by the air cushion in the pressure cylinders, as well as by gravity. When the apparatus is to be used for leveling ballast, the pins f^2 are placed in the intermediate openings of the bell cranks F and the blades are then lowered as before described. To elevate the blades to their inoperative position, the four-way valve O is reversed so as to admit compressed air on the opposite side of the pistons in an obvious manner, the pins f^2 being in that case placed in the lowermost openings of the bell crank. Should the engineer neglect to raise the flanger-blades on approaching a switch, frog or crossing, the blades on striking one or another of such obstructions will slide rearwardly and upwardly on their guides owing to their curved form, thus yielding to and passing over the obstruction without injuring the blades or the track, the blades dropping to their operative position after clearing the obstruction.

While effectively guarding against accidental breakage of or injury to the flanger-blades or the track, my improved apparatus can be conveniently manipulated and its construction is comparatively simple and inexpensive.

I claim as my invention:

1. The combination of a railway car, a guide carried thereby and arranged in a substantially upright position, said guide being curved in a plane lengthwise thereof and a flanger-blade slidably mounted on said guide to follow the curvature thereof.
2. The combination of a railway car, a substantially upright guide secured thereto and curved in a plane lengthwise of the guide, and a curved flanger-blade slidably mounted on said guide.
3. The combination of a railway car, a substantially upright guide secured thereto and curved in a plane lengthwise of the guide, and a flanger-blade slidable vertically on said guide and curved concentrically therewith.
4. The combination of a railway car, a substantially upright guide secured thereto

and curved in a plane lengthwise of the guide, a curved flanger-blade mounted to slide vertically on said guide, and means for raising and lowering said blade.

5 5. The combination of a railway car, a flanger-blade movable substantially vertically thereon, a pressure cylinder and piston, an operative connection between said piston and said blade, an indicator comprising a rotary spindle and a target mounted thereon,
10 and means for transmitting motion from said connection to said spindle.

6. The combination of a railway car, a

flanger-blade movable substantially vertically thereon, a pressure cylinder and piston, an operative connection between said piston and said blade, a rotary spindle carrying an indicating target and having an actuating arm, and a link extending from said arm to said connection. 15 20

Witness my hand this 26th day of June, 1912.

BENJAMIN F. LAWRENCE.

Witnesses:

C. F. GEYER,

E. M. GRAHAM.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."