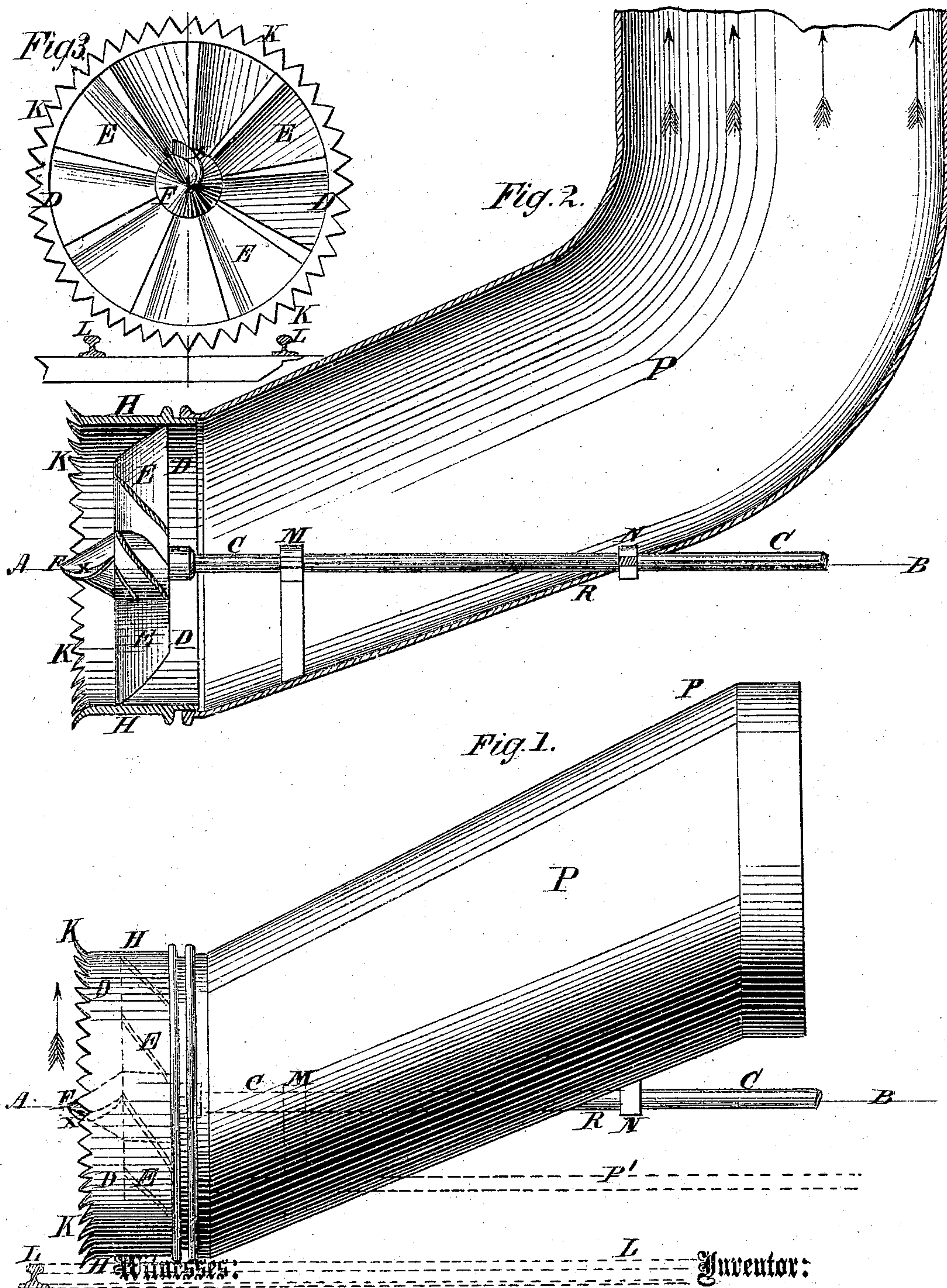


F. G. JOHNSON.
 Improvement in Snow-Excavators for Railways.
 No. 130,807. Patented Aug. 27, 1872.



Witnesses:
 John Becker
 Gustave Dietrich

Inventor:
 Frank G. Johnson

UNITED STATES PATENT OFFICE.

FRANK G. JOHNSON, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN SNOW-EXCAVATORS FOR RAILWAYS.

Specification forming part of Letters Patent No. 130,807, dated August 27, 1872.

To all whom it may concern:

Be it known that I, FRANK G. JOHNSON, of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Machine, which I will style a Railway Snow-Cleaner, being a device for removing snow, especially deep snow, from railways; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing, making a part of this specification, in which—

Figure 1 is a side elevation; Fig. 2, a horizontal longitudinal section; Fig. 3, a front transverse elevation.

The nature of my invention consists essentially in placing in front of a platform rail-car a vertical wheel rigidly fastened on a horizontal shaft, which is supported by bearings fastened on the platform of the car, the wheel being made of radiating blades set at such angles with the plane of the wheel as to cut the snow in front and throw it through and back of the wheel when it is revolved, the diameter of the wheel being equal to the width of the required cut through the snow. To provide for the delivery of the snow as it passes through the wheel, the wheel is surrounded with a pipe which extends backward, upward, and outward in such a direction and to such a distance as to deliver the snow upon the banks of the cut made through the snow by the wheel. The wheel is made to revolve with great velocity by means of steam-power applied to the shaft; the object of the high rate of speed of the wheel being, not only to exert great mechanical force to cut the snow and throw it back through the wheel and pipe, but to create a more or less perfect vacuum immediately in front of the wheel to drive the snow into the wheel and pipe by atmospheric pressure, and also to create a powerful current of air through the pipe, as additional means of forcing the snow rapidly through it.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation more in detail.

A B is the line of the shaft. C C represent the shaft upon which the wheel is fastened; M N, the bearings of the shaft, which are secured to the platform of the car, the bearing

M being placed within and near the front end of the pipe by means of a brace extending from the car into the pipe. At R the shaft passes through the lower side of the pipe, to the right of which point, wherever it may be the most convenient, the steam-power is applied to the shaft to drive the wheel, the engine and boiler furnishing the power being placed at the rear portion of the car. D D represent the wheel, H H being its periphery, which is a short cylinder, somewhat longer than the width of the blades E E. This periphery of the wheel extends back of the blades, projecting into and working in the front end of the discharge-pipe P P to prevent the passage of the snow and air into the discharge-pipe back of the wheel. The periphery extends in front of the blades E E, and is provided on its front edge with suitable teeth, similar to saw-teeth, K K, to cut a circular groove in front or advance of and a little outside of the ends of the blades, so that the blades as they follow up will have a defined cylinder of snow to cut and remove. F is a cone or nose placed in front of and fastened to the center of the wheel, for the purpose of dividing the snow at the center of the wheel, and passing it away from the center of motion, to enable the blades to take it at a suitable distance from the line of the shaft, and where the rotary motion will be considerable, and so handle and throw it back through the wheel. Upon this cone or nose is provided a somewhat spiral lip or blade, x, Fig. 2, the better to enable the nose to penetrate the snow. The blades of the wheel D D are set at such an angle with the plane of the wheel, and made of such width and provided with such a twist from the center to the periphery of the wheel, as will render them most effective in carrying back the snow and in creating a current of air through the discharge-pipe P P. P P is a discharge-pipe, through which the snow is driven by the wheel, and by the current of air created by the action of the wheel, and delivered upon the bank or banks of the cut through the snow made by the wheel. Fig. 1 shows the position of the front end of this pipe, which is carried or extended down in front of the car so as to bring its lower edge as near the ground as it is safe to place it. Fig. 2 represents the side turn given to the pipe for the purpose of directing and deliver-

ing the snow on or at one side of the cut, as indicated by the arrows at the mouth. This discharge-pipe may be so arranged as to discharge the snow on both sides of the track or cut of the road, or one side at one time or place, and on the other side at other times and places, as may be most desirable in any given case. Fig. 3 represents a front view of the wheel, showing its relation to the track L L of the road, by which it will be seen that the lower edge of the wheel and the front end of the pipe come down on a level with the track of the road.

The car upon which this device is mounted can be moved up to the snow with such speed as the working of the machine may require by means of coupling the axle of the car-wheels to the machine itself, so as to render it self-feeding, or it can be moved up to the snow by means of an ordinary locomotive attached to the rear end of the car.

It will be noted that my wheel differs from the screw-conveyers heretofore used for forcing the snow up through tubes by acting upon large masses or spiral columns of snow at a slow speed, in that the vanes or blades are much more numerous for disintegrating the snow; also, that, besides being adapted for cutting the snow into fine particles, they are also adapted, by reason of being short or narrow in the direction of the spiral lines in which they are arranged on the shaft like the blades of a fan-wheel, for generating a powerful blast through the tube; also, in having the periphery band or rim attached to the outer ends; and, also, in being fitted to the end of the tube by a joint which prevents the air from entering the tube to any material extent without being acted on by the fan or

wheel; and the arrangement of the tube is different from the aforesaid screw-conveyer tubes, in that it is adapted for the aforesaid connection of the wheel.

While I prefer to have the wheel project beyond the end of the tube, as here shown, I do not mean to limit myself to such arrangement, but reserve the right to arrange it within the end of the tube, and use the latter for separating the cylinder of snow to be removed from that which remains by being pushed forward into the snow if I choose to do so.

I claim as my invention—

1. The combination, with a tube, of a wheel with numerous spiral vanes or blades adapted for disintegrating the snow and generating a draft of air capable of drawing the snow into the front of the tube and expelling the disintegrating particles from the rear or upper end of said tube, the said wheel being impelled at such velocity as to so disintegrate and expel the snow, and the said tube and wheel being arranged on a railway car, all substantially as specified.

2. In rotary snow-cleaners for railways, the snow cutting and impelling wheel provided with a rim, H, and said rim arranged with the end of the tube, as described, and as represented in Figs. 1 and 2 of the drawing.

3. The combination, with the said wheel of the points or cutters K, substantially as specified.

4. The combination, with the said wheel, of the blade *x*, substantially as specified.

FRANK G. JOHNSON.

Witnesses:

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