

A. N. KEIRKNER.
Rail-Sanding Apparatus for Locomotives.
No. 223,231. Patented Jan. 6, 1880.

Fig. 1.

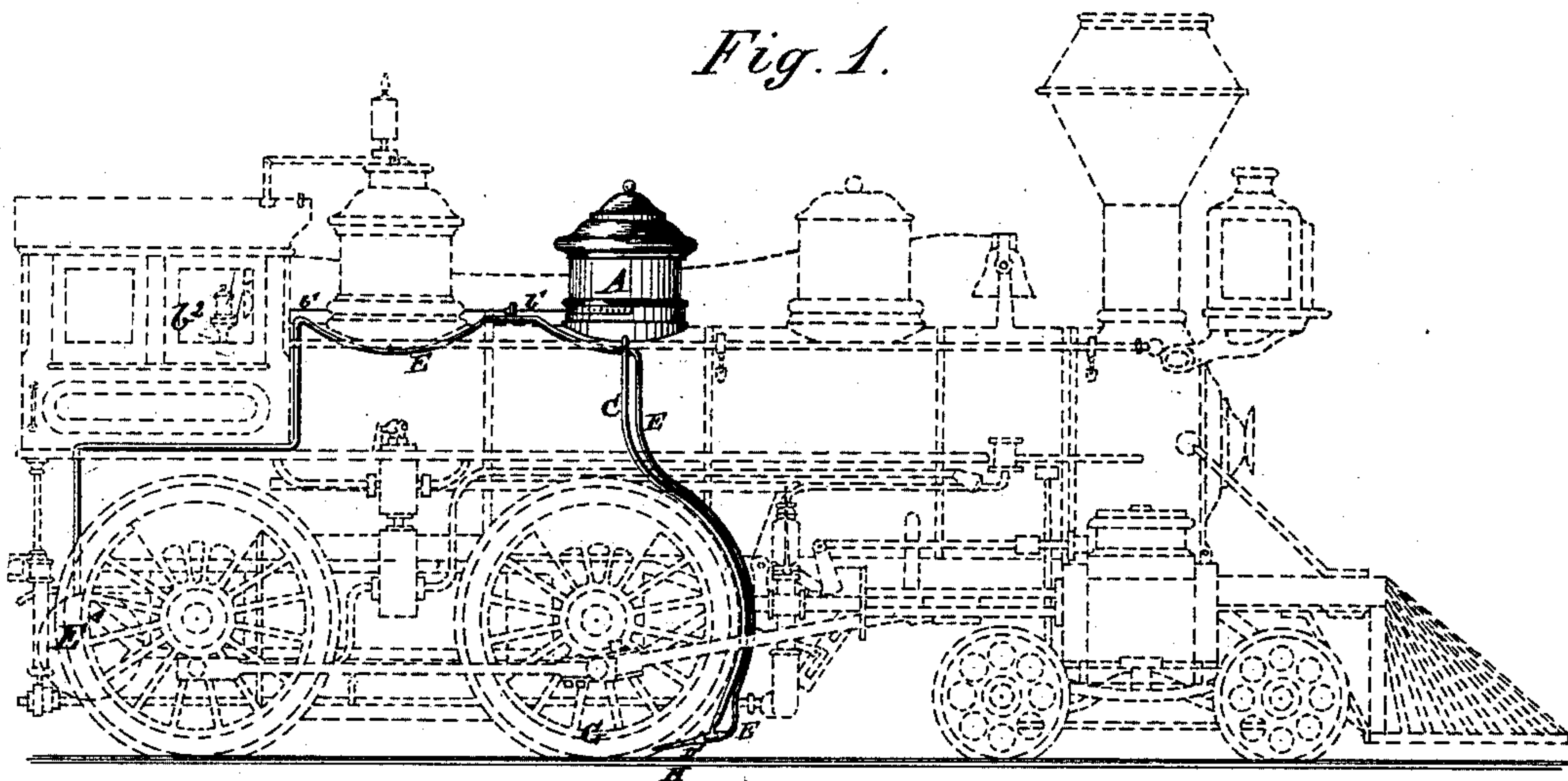


Fig. 3.

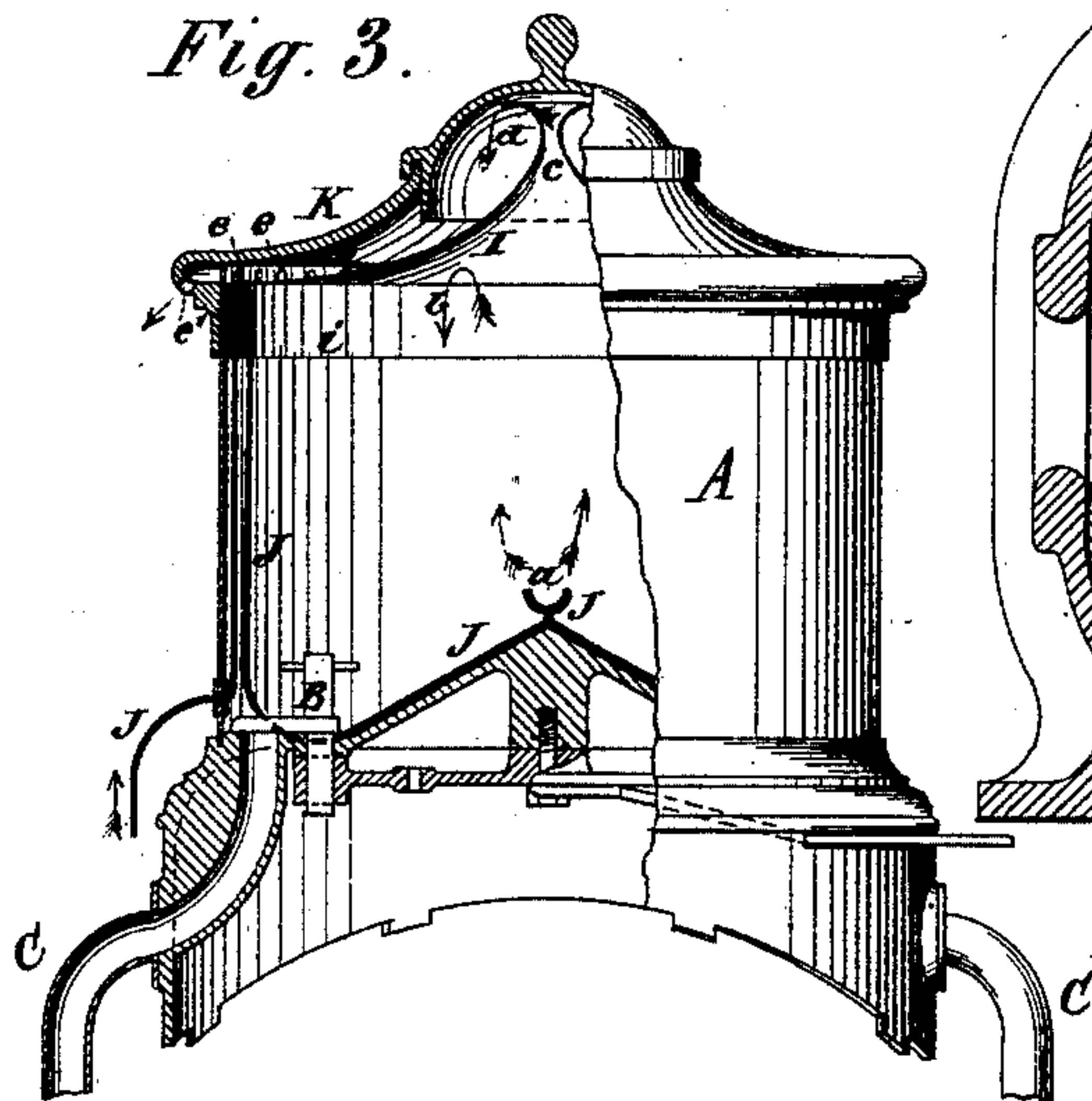


Fig. 5.

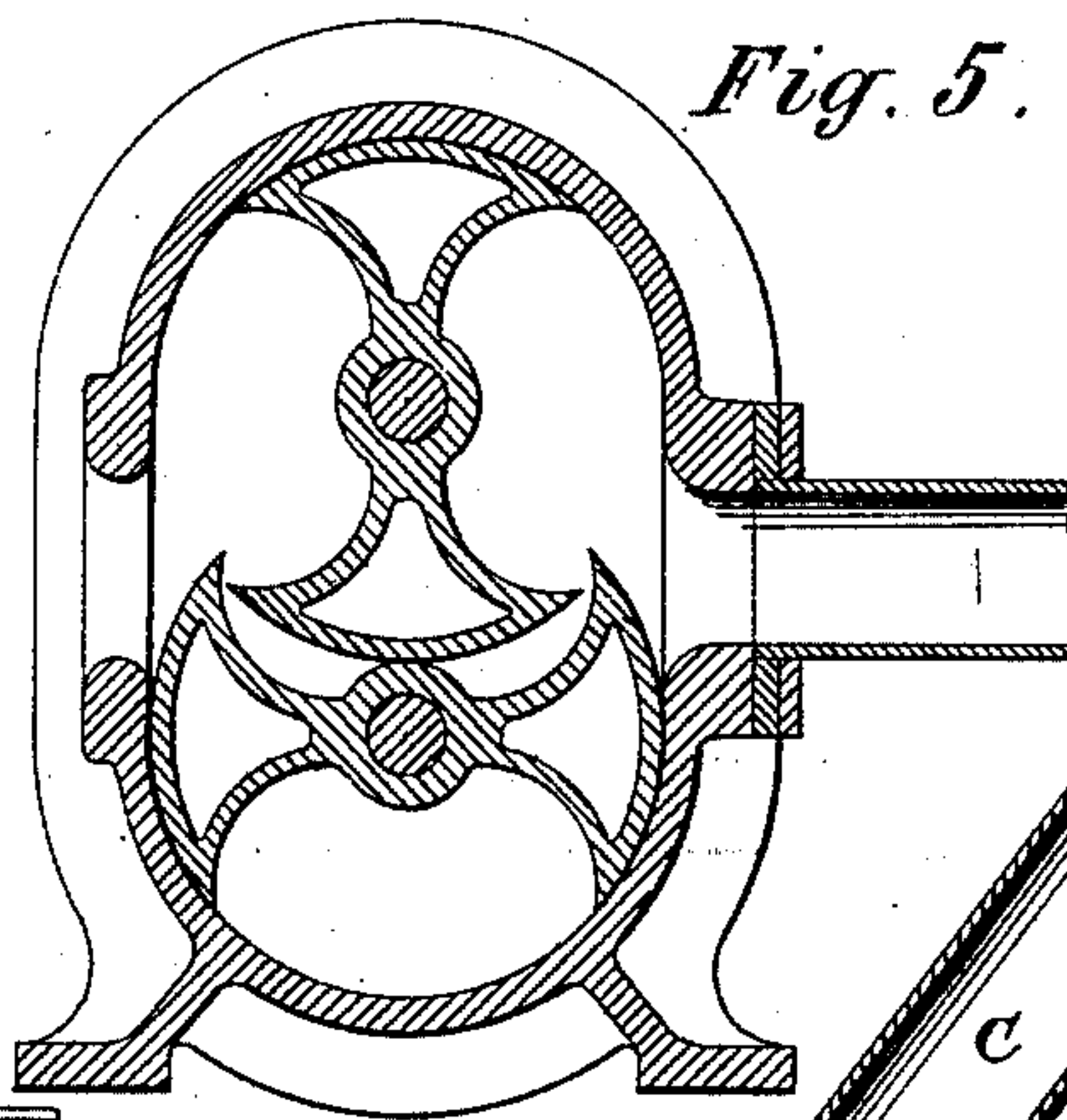


Fig. 2.

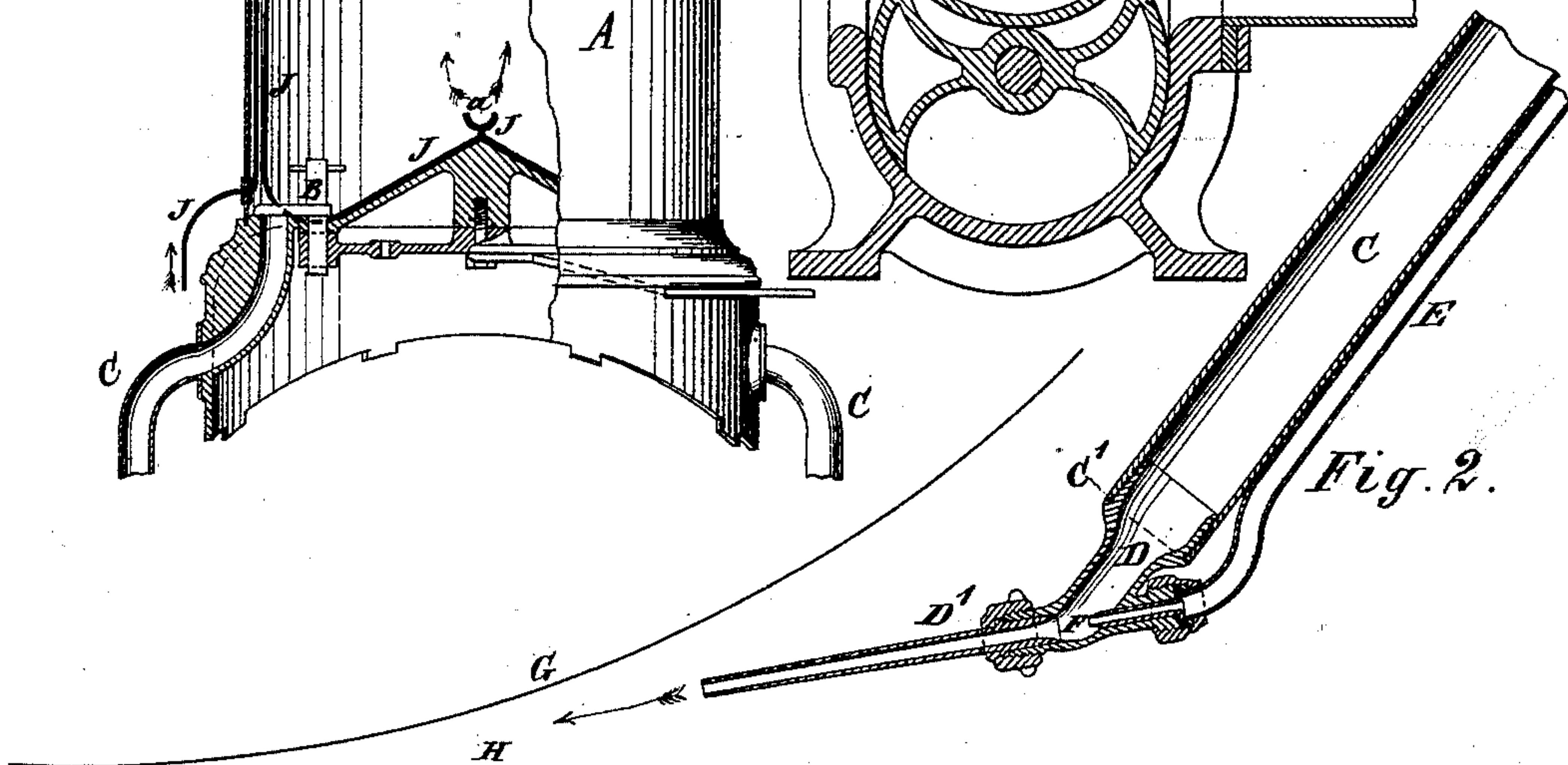
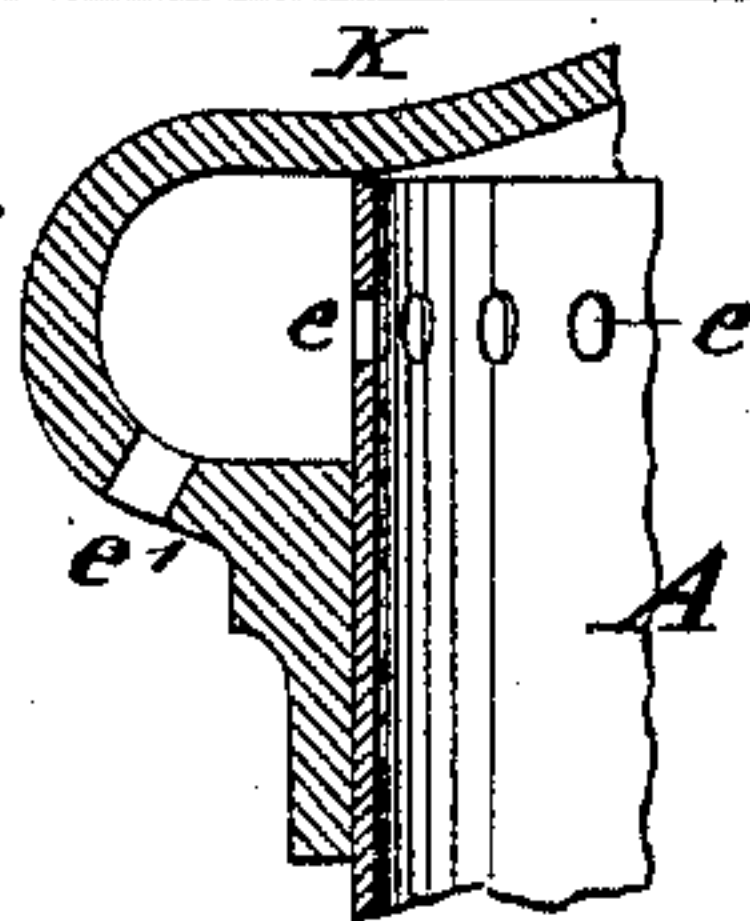


Fig. 4.



Witnesses:

H. Rydquist.

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per C. W. Janson

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UNITED STATES PATENT OFFICE.

AUGUST N. KEIRKNER, OF MOTALA, SWEDEN.

RAIL-SANDING APPARATUS FOR LOCOMOTIVES.

SPECIFICATION forming part of Letters Patent No. 223,231, dated January 6, 1880.

Application filed February 6, 1879.

To all whom it may concern:

Be it known that I, AUGUST NSON KEIRKNER, of Motala, in the Kingdom of Sweden, have invented a new and useful Improvement in Rail-Sanding Apparatus for Locomotives, of which the following is a specification.

My invention relates to apparatus used on locomotives to apply sand upon the rails in front of the driving-wheels while the engine is running, in order to produce friction enough to maintain the proper traction and prevent slipping on an up grade, or when the rails have become slippery by wear or by frost or other influences of the weather.

The main object of my invention is to effect the application of the sand directly at the point of contact between the wheel and the rail.

The invention therefore consists in the combination, with the sand-pipe provided at its lower end with a rearward-pointing opening or nozzle, of an air-pipe having a similar nozzle entering the lower end of the sand-pipe opposite the inner end of the sand-pipe nozzle; and in the combination, with the sand-pipe and an auxiliary air-pipe, of a sand-nozzle and an air-nozzle, both pointing into the angle between the wheel and the rail, the latter nozzle being arranged behind and in axial line with the former, and both coupled to a common holder or curved hollow casting attached to the lower end of the sand-pipe.

It also consists in the combination, with the sand-box, of an inside air-pipe discharging into the box to raise, agitate, and dry the sand, and thus prevent it from packing; and in the combination, with the said sand-box having inside air-pipe and escape-apertures for the air, of a deflector to prevent the escape of sand through the apertures for the escape of air, as will be hereinafter described.

In the accompanying drawings, Figure 1 represents a side view of a locomotive using compressed-air brake and provided with my improved sanding apparatus. Fig. 2 is a vertical section of the lower ends of the sand and air pipes with their nozzles. Fig. 3 is a rear elevation of the sand-box, partly in section. Fig. 4 is a detail of a portion of the same enlarged from Fig. 3. Fig. 5 is a sectional elevation of an air-blower for use on locomotives

not otherwise provided with apparatus for inducing a current of air.

Similar letters of reference indicate corresponding parts.

A is the sand-box. B is one of the sand-valves, operated by a rod, b' , from the cab b^2 , in the usual manner. The sand-valves B close the upper ends of the usual sand-pipes C, which lead from the box A to the rails H.

In the construction hitherto in use the sand drops from the lower open end, C' , of the pipe C directly onto the rail, and striking the latter with the velocity acquired by the fall, the greater portion falls off the rail, which effect also is enhanced by the unavoidable vibrations of the rails and locomotive. At variations in speed of the engine the sand distributes unevenly, and, on stopping, collects in hills on the rail.

My invention is designed to remedy these defects. For this purpose the lower end of the sand-pipe C is extended by a hollow casting or pipe, D, provided with a rearward and a forward pointing nipple, to which are attached by couplings, respectively, the sand-nozzle D' , pointing in the angle between the wheel G and rail H, and the air-nozzle F, arranged in the same direction in axial line with the nozzle D, as shown in Fig. 2. The nozzle F is connected to one end of the pipe E, whose other end is connected to the compressed-air reservoir E' .

The pipe E should be arranged to lead from the reservoir up to the cab b^2 , so that its air-valve or stop-cock may be placed within convenient reach of the engineer, and preferably connected by an arm or link to the rod b' , in order that a current of air may be admitted through the pipe E to the nozzle F simultaneously with the opening of the sand-valve B for admitting sand through the pipe C to the nozzle D' .

The sand, on reaching the lower end of the casting D, or the entrance to the nozzle F, is impelled by the current of air from the nozzle F and injected in the angle between the wheel and the rail even to the point of contact between them.

The pipe E is preferably arranged along the pipe C, as shown in the drawings.

In the sanding device as heretofore constructed it frequently happens that on opening the valve B the sand fails to drop on account of being more or less damp, and therefore clogging. In order to avoid this and keep the sand dry, I arrange inside of the sand-box A an air-pipe, J, leading from the compressed-air reservoir E' along and close to the lagging of the boiler, and discharging its thus heated and dried air at the center of the box A in about the direction of the arrows *a*.

The pipe J may be coiled or otherwise bent to increase its heating-surface in the box A.

The upper end of the box A, I close by means of a conical or conoidal plate, I, fitted tight within the cylindrical wall of the box A by means of a circular rim, *i*, or other contrivance. At the apex of the conical plate I is an opening, *c*.

The cover K, resting upon the upper edge of the wall of the box A, is perforated at *e'* around its circumference, and the upper rim of the wall above the plate I, between the latter and the cover K, is similarly perforated at *e*.

By this construction the sand, dried and raised by the air-current from the pipe J, is thrown up against the plate I, from which it is deflected downward, as indicated by the arrow *b*, and thus kept circulating in constant commotion and dried, while the air alone escapes through the central opening, *c*, of the plate I, and thence in the direction of the arrow *d* through the apertures *e e'* into the atmosphere.

In locomotives provided with the vacuum-brake the necessary air-current may be induced by a current of steam. In case of their being no air-brake, a small blower, such as shown in Fig. 5, may be used to supply the air-current by power from the engine. This blower should be placed upon the fire-box to dry and heat the air-current, thereby also effecting a partial thawing of the ice on the rails when the latter are frozen.

I am aware of attempts having been made to keep the sand dry and assist in discharging it in the angle between the wheel and rail by arranging within the sand-box a steam-vessel to heat the sand, and by surrounding the sand-pipe throughout, or nearly so, its entire length with a pipe leading steam from the said steam-vessel and discharging it at the extreme lower

end of the sand-pipe, the velocity of the steam causing a partial vacuum at the extreme end of the sand-pipe. Such an arrangement is shown in a patent issued to one E. Tolles, October 9, 1841; but in that case the sand in the box is liable to clog notwithstanding the steam-vessel, there being no provision for keeping the sand in commotion while attempting to vaporize its moisture, and the vacuum produced at the lower end of the sand-pipe is not, by far, as efficient in dislodging the sand as is my mode of entering the air-pipe E in the rear of the nozzle of the sand-pipe C, and thus ejecting the sand (which fills the nozzle D' and lower end of the sand-pipe C in front of the air-nozzle F) by direct pressure, while aiding a like quantity of sand to fall down in front of the air-nozzle by the vacuum caused by said direct current.

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

1. The combination, with the sand-pipe C, provided at its lower end with a rearward-pointing opening or nozzle, D', of the air-pipe E, having a similar opening or nozzle, F, entering the lower end of the sand-pipe C opposite the inner end of the nozzle D', substantially as and for the purpose set forth.

2. The combination, with the sand-pipe C and air-pipe E, of the sand-nozzle D' and the air-nozzle F, both pointing into the angle between the wheel and rail, the nozzle F being arranged behind and in axial line with the nozzle D', and both coupled to a common holder, D, attached to the lower end, C', of the sand-pipe C, substantially as and for the purpose set forth.

3. The inside pipe, J, arranged to discharge air into the sand-box A to raise, agitate, and dry the sand, substantially as set forth.

4. The sand-deflector I, having an air-escape, *c*, in combination with the sand-box A, having an inside air-pipe, J, and air-escape apertures *e e'*, substantially as and for the purpose specified.

The above specification of my invention signed by me this 15th day of September, 1877.

AUGUST NSON KEIRKNER.

Witnesses:

MORRIS MOLANDER,
THURO FORZSELL.