3 Sheets—Sheet 1.

# J. J. ANTHONY.

## Locomotive.

No. 206,697. Patented Aug. 6, 1878.

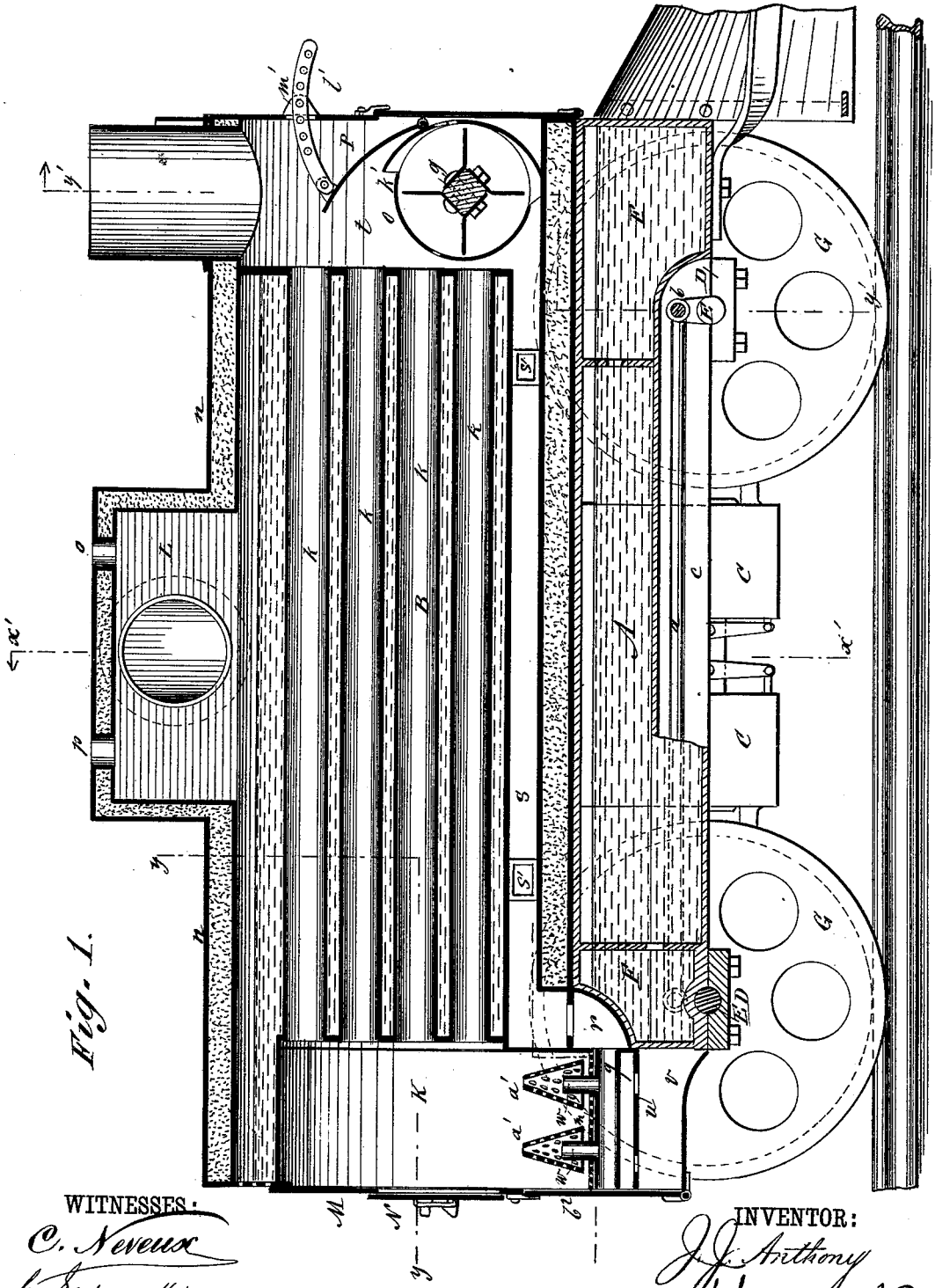

Fig. 1.

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## Locomotive.

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Fig. 4.



Fig. 2.

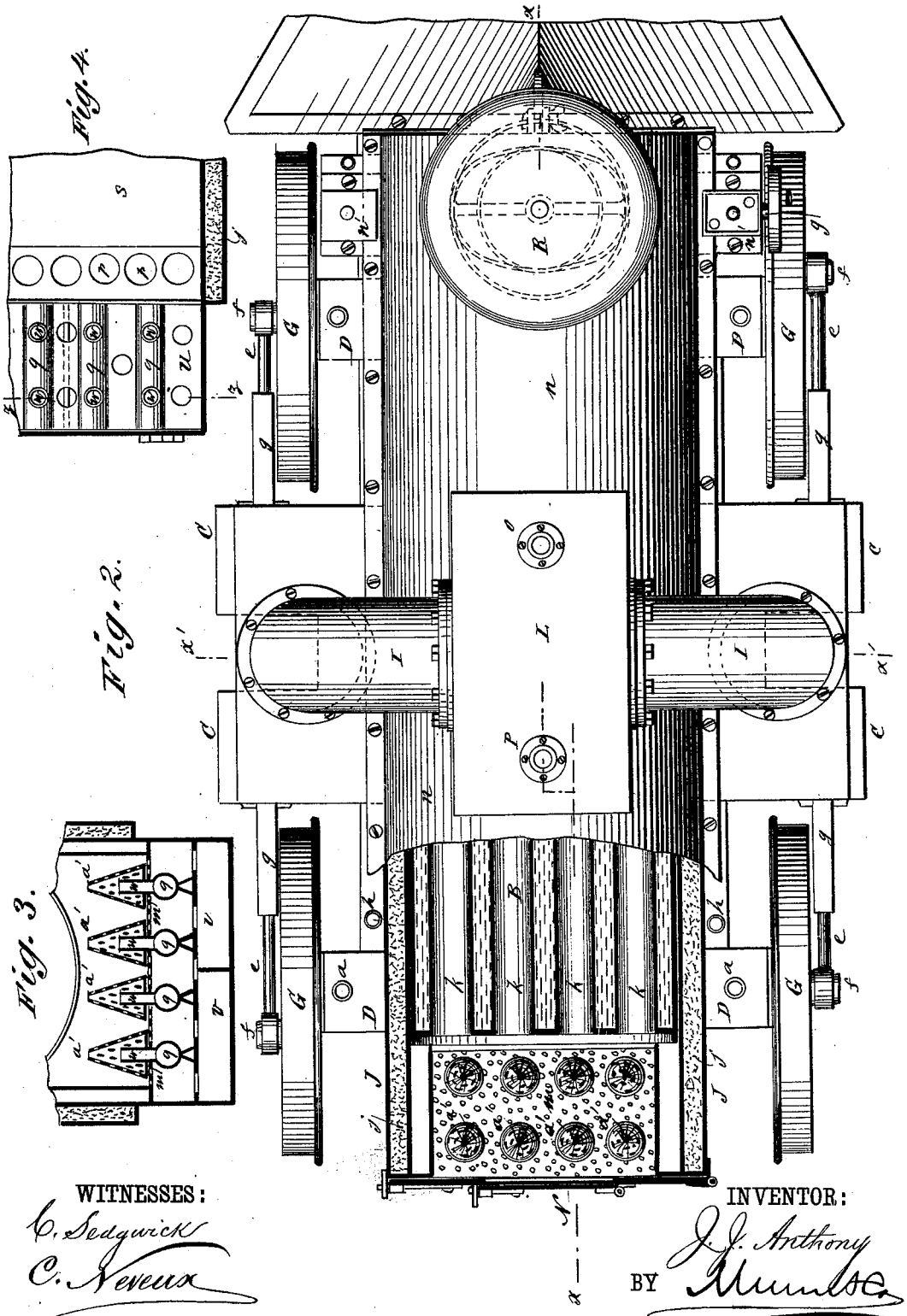

Fig. 3.



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## Locomotive.

No. 206,697. Patented Aug. 6, 1878.

Fig. 6.

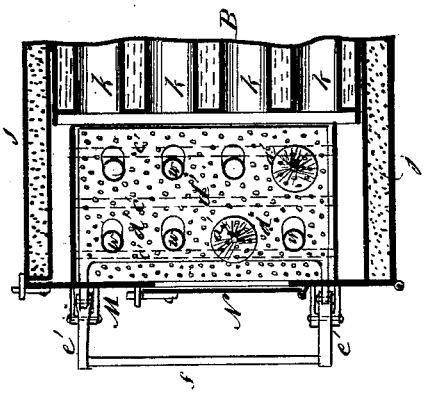
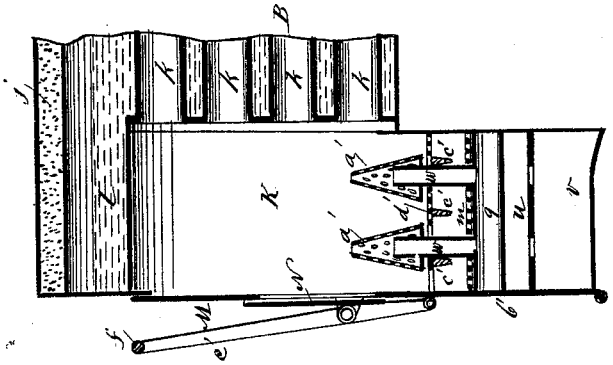


Fig. 5.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

JACOB J. ANTHONY, OF SHARON SPRINGS, NEW YORK.

## IMPROVEMENT IN LOCOMOTIVES.

Specification forming part of Letters Patent No. **206,697**, dated August 6, 1878; application filed May 21, 1878.

*To all whom it may concern:*

Be it known that I, JACOB J. ANTHONY, of Sharon Springs, in the county of Schoharie and State of New York, have invented a new and useful Improvement in Locomotives, of which the following is a specification:

Figure 1 is a vertical longitudinal section; Fig. 2, a plan view, partly in section. Fig. 3 is a transverse section; Fig. 4, a plan view of part of grate. Figs. 5 and 6 represent a modification of the grate.

Similar letters of reference indicate corresponding parts.

The invention will first be described in connection with the drawing, and then pointed out in the claims.

A indicates a water-tank, B the boiler, C cylinders, D D journal-boxes having oil-supply tube *a*, E E the axles, and G G the drive-wheels, of the locomotive. The axle-cranks *b* rotate in a recess, *c*, and are connected by a rod, *d*. The pistons are connected by rods *e* with crank-pins *f*. I is the steam-pipe, and *h* the exhaust. A sand-filled casing, J *i j*, surrounds the boiler. The latter has tubes *k*, a fire-box, K, and steam-dome L. *n* is a sand-filled jacket. The steam-dome L is provided with a whistle-pipe, *o*, and a safety-valve pipe, *p*, and the steam-pipes I are connected with opposite sides of the steam-dome. The grate *m* is supported on tubes *q*, which are in communication with a space, *r*, in the end of the water-tank A, which space communicates with a return-flue, *s*, which is formed between the boiler and the bottom of the casing J, and leads to the smoke-box *t*. The tubes *q* are supported by an apertured plate, *u*, below which there is an ash-box, *v*. Short tubes *w* are connected with the tubes *q*, and project upward through the grate *m*. To the tubes *w* are fitted hollow cones *a'*, which are perforated to permit of the escape of air to the fire. This arrangement of the grate and cones is designed for burning coal-slack and other kinds of finely-divided fuel.

In front of the ash-box *v*, grate *m*, and the lower part of the fire-box there is a door, *b'*, which is hinged to the bottom of the ash-box. The upper portion of the fire-box is closed by a door, M, which is hinged to the side of the casing. In this door there is a smaller door, N, through which fuel is introduced into the fire-box and through which the fire is adjusted. There is no draft-opening in the fire-box or ash-box.

In Figs. 5 and 6 a modification of the grate arrangement is shown, in which transverse bars *c'* are placed across the fire-box a short distance above the grate *m*. Upon these transverse bars is placed a grate, *d'*, having oblong holes, through which the tubes pass. The perforated cones are placed on the tubes, as in the other case, and two rods project from the front of the grate through notches in the lower door in front of the fire-box, and are connected with two levers, *e'*, that are pivoted to ears projecting from the side of the fire-box at their lower ends, and are connected at their upper ends by a rod, *f'*. By means of these levers the grate *d'* may be shaken so as to loosen the fire and remove the ashes.

In the smoke-box *t* at the forward end of the boiler there is a fan-blower, O, which is placed horizontally, with its shaft *g'* projecting through the sides of the casing J. The blower-shaft *g'* revolves in boxes *h'*, which have hollow walls or cavities for containing water, which keeps the journal cool. The upper half of each journal-box is provided with a funnel, *i'*, by which it is filled with water, and with a tube, *j'*, which passes through the funnel for receiving oil for the journal.

The blower is driven by a small independent engine, which is placed near it, and may be connected directly with the blower-shaft, or it may be placed on some other part of the boiler and connected with the blower by a belt. The blower-casing has a suction-opening, *k'*, in its upper side, which opens toward the flues of the boiler, and it has a discharge-opening in the lower side, which discharges into the flue *s* under the boiler. The flue *s* is provided with side apertures *s'*, having suitable covers, for removing ashes and cinder. Above the blower there is a deflector, P, which is hinged to the upper side of the blower-casing, and is capable of being adjusted so as to gather more or less of the smoke and gas that come through the flues. A curved and apertured bar, *l'*, is jointed to the deflector, and extends through a hole in the front of the smoke-box, and is held in any required position by a pin, *m'*, that passes through it

and through ears $n'$ that project from the front of the smoke-box.

The casing of the blower O is secured in the smoke-box $t$ by means of bolts that pass through its heads and through the sides of the box, and it may at any time be removed without disturbing other parts of the engine by simply taking out the bolts. The front side of the blower-casing is apertured to admit cinders that fall from the smoke-stack and upper part of the smoke-box, so that they may be forced back to the fire-box by the action of the blower, and the ends of the casing are provided with valves for the admission of air. The upper end of the smoke-stack is formed entirely of fine wire-cloth, which prevents the escape of cinders. A metallic umbrella, R, is supported a short distance above the smoke-stack, to prevent the entrance of rain or snow.

The locomotive is provided with the usual pilot and with a cab and tender of the usual description.

The advantages claimed for my improved locomotive are that it consumes the smoke and gas, which are now allowed to escape from the smoke-stack, and returns the cinders to the fire-box, thereby avoiding the annoyance occasioned by the flying of cinders into the car-windows. By placing the cylinders between the drive-wheels the strain is taken almost entirely from the tank or frame.

By the employment of the perforated cones and the blast, coal-slack and other kinds of finely-divided fuel may be burned, thus effecting a great saving in the cost of fuel.

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

1. The tubes $q$, pipes $w$, perforated cones $a'$, and grate $m$, in combination, substantially as herein shown and described.

2. The movable grate $d'$ and the cones $a'$, in combination, substantially as herein shown and described.

3. The fire-box K, having the movable grate $d'$, perforated cones $a'$, and air-tubes $q$ $w$, and provided with a closed front and air-tight ash-pit, $v$, substantially as herein shown and described.

4. The combination of the adjustable deflector P with the blower O, the flue $s$, tube $q$, pipes $w$, and perforated cones $a'$, as shown and described.

JACOB J. ANTHONY.

Witnesses:
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