

J. M. FOSS
LOCOMOTIVE DRAFT-REGULATOR.

No. 179,182.

Patented June 27, 1876.

Fig. 1.

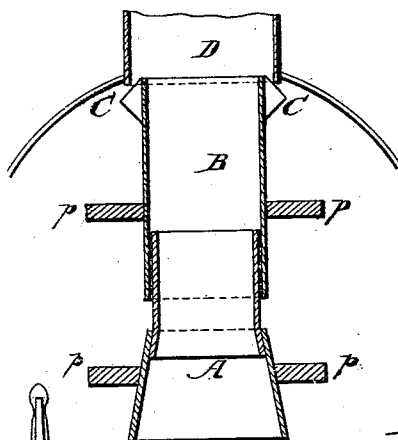


Fig. 2.

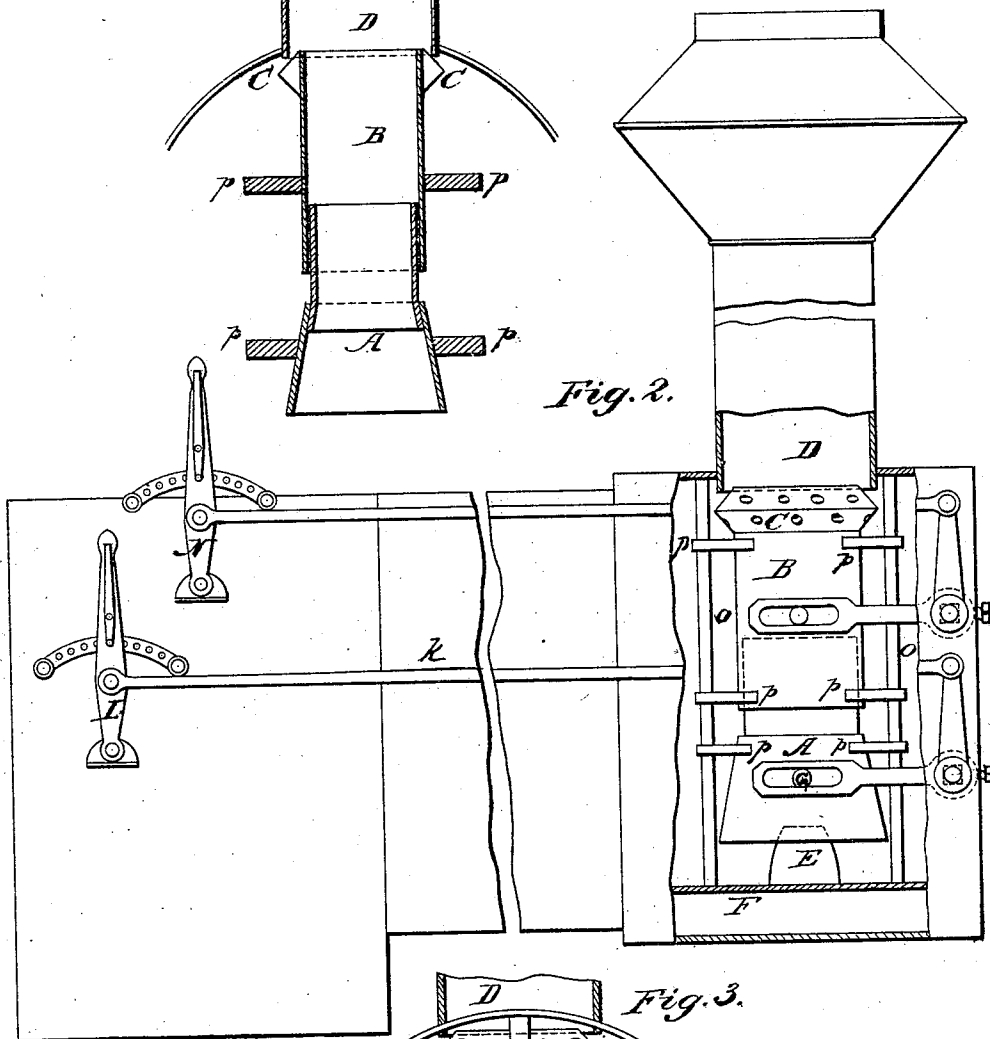
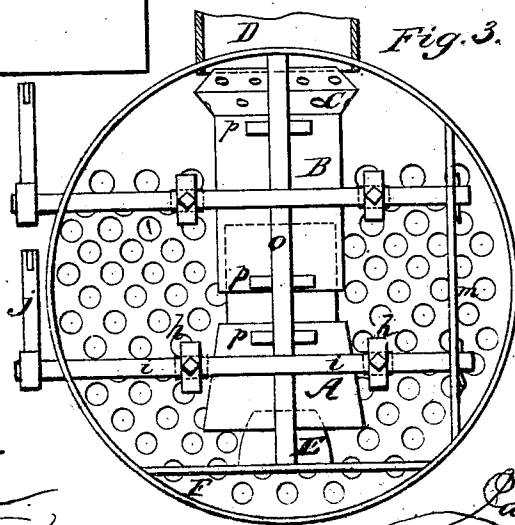


Fig. 3.



Witnesses.

R. Camp
Wm J. Robertson

Inventor:

James M. Foss

UNITED STATES PATENT OFFICE.

JAMES M. FOSS, OF ST. ALBANS, VERMONT.

IMPROVEMENT IN LOCOMOTIVE DRAFT-REGULATORS.

Specification forming part of Letters Patent No. **179,182**, dated June 27, 1876; application filed May 25, 1874.

To all whom it may concern:

Be it known that I, JAMES M. FOSS, of the village of St. Albans, in the State of Vermont, have invented a Locomotive Draft-Regulator, of which the following is a specification:

The object of my invention is, first, to prevent sparks and cinders from being drawn through the exhaust-pipes into the steam chests and cylinders; second, to burn the coked coal within the fire-box, instead of allowing it to be thrown out through the smoke-pipe into the air, and into the doors and windows of the cars, in the form of sparks; third, to lessen the amount of fuel required by a locomotive in doing a given amount of work, by enabling the engineer at all times to control at pleasure the draft on the fire.

My invention is illustrated by the accompanying drawings.

Figure 1 represents my locomotive draft-regulator, without its surroundings, when in position within the smoke-arch, and without the levers, &c., required to hold it in position and to operate it. Fig. 2 represents a side view of my invention, in position within the smoke-arch, together with the levers, &c., required to hold it in position and to operate it. Fig. 3 represents a view of the same as seen from the front end of the locomotive when the entire covering of the end is removed.

A and B are pipes constructed of sheet-iron or of any other suitable material. The pipe A has the form, and may be about the size, of an ordinary locomotive petticoat or draft pipe. Its upper end telescopes the lower end of the pipe B, either within or without, with a sliding fit. The lower part of the pipe B is similar in form to the upper part of the pipe A. On the outside, near its upper end, the pipe B has attached to it a wedge-edged annulus, C, of sheet-iron, having its circumference greater than the circumference of the mouth of the smoke-pipe D. A few holes of about half an inch in diameter are cut in the annulus C. Directly underneath the annulus, in the wall of the pipe itself, similar holes are cut. This wedge-edged annulus may be substituted by an annular rim of sheet-iron, having its circumference a little less than the circumference of the mouth of the smoke-pipe. In this case the narrow annular space between the

rim and the inner wall of the smoke-pipe will answer the same purpose as the holes in the wedge-edged annulus C. The length of the pipes A and B should be sufficient to allow one (when the two are telescoped and in position in the smoke-arch) to extend into the other, so far as to hold it firmly, and guide it well when drawn out to the fullest extent required.

The pipes A and B, constructed and telescoped as now described, are suspended within the smoke-arch of the locomotive, as in Figs. 2 and 3, directly over the exhaust-pipes E, so that when the pipe A is lowered it may surround them. Just below the tips of the exhaust-pipes a horizontal plate, F, of iron, or other suitable material, is firmly held in place by supports or by the walls of the smoke-arch. Through this plate F the exhaust-pipes E pass with a tight fit, so that when the pipe A is let down upon the plate the lower end of the pipe is closed, and the exhaust-tips are shut in from the smoke-arch.

With the pipe A in this position no sparks nor cinders can reach the exhaust-tips to be drawn in through the exhaust-pipes into the steam chests and cylinders.

In some locomotives it may be as well to use the bottom of the smoke-arch in place of the plate F to close up the lower end of the pipe A.

Now, when the pipe B is raised so that the wedge-edged annulus C sets into and shuts the mouth of the smoke-pipe D, a closed passage is formed (bating the few small holes in the wedge-edged annulus C) through the smoke-arch, from the exhaust-nozzles to the open air, through which the exhaust steam or air from the cylinders will shoot without producing any essential draft on the fire.

The slight excess of smoke or fumes that may form in the fire-box while the pipes A and B are in the position named, will, however, be drawn through the holes in the wedge-edged annulus C, the capacity of these holes being only sufficient for this purpose.

The pipe A is suspended and held in position within the smoke-arch, and is raised and lowered by means of lugs *g* attached to its opposite sides, the slotted arms *h*, the rocker-shaft *i*, arm *j*, rod *k*, and handling lever *L*.

within the cab. The rocker-shaft is supported at one end by the standard *m* within the smoke-arch, and at the other end by the wall of the smoke-arch, through which it passes. The pipe B is suspended, and held in position, and is raised and lowered by a similar succession of lugs, arms, rocker-shaft, &c., terminating with the lever N within the cab.

In order to keep the pipes A and B in line, so that they may always work freely when raised or lowered, two upright rods, O, are secured in position within the smoke-arch, in front and rear of the pipes, to act as guides for the forked lugs *p*, which are firmly fastened to the pipes.

With my invention, constructed and arranged as now described, the engineer can, from within the cab, raise or lower the pipe A or B at pleasure.

When starting his engine, when reversing it, or when running with steam shut off, he may drop the pipe A down on the plate F, and, shutting in the exhaust-tips from the smoke-arch, prevent sparks and cinders from being drawn into the steam chests and cylinders. He may at the same time raise the pipe B, and close the mouth of the smoke-pipe D, and thereby form the inclosed passage between the exhaust-tips and the open air, through which the exhaust steam or air from the cylinders will shoot, without producing a draft on the fire.

Again, when running with steam on, he may

raise the pipe A and lower the pipe B as much or as little as he may choose, and in this way equalize the draft through the upper and lower flues, and secure precisely the amount of draft on the fire necessary to cause the most economic combustion in the fire-box, and consume therein the coked coal, instead of allowing it to be thrown out through the smoke-pipe into the open air, and into the doors and windows of the cars, in the form of sparks. In either case, when working steam or running with steam shut off, a large amount of the waste of fuel hitherto unavoidable in the working of a locomotive is prevented by this invention, and the amount of fuel required to do a given amount of work is materially lessened.

I claim as my invention—

1. In combination with the exhaust-tips, surrounded by a tight plate or the smoke-arch, and with the smoke-pipe D, the pipes A and B, sliding one within the other, as described, and capable of independent movement from the cab, substantially as and for the purposes set forth.

2. The upper movable pipe B, provided with the perforated annulus C, for the escape of the excess of smoke accumulated when the direct draft is closed, substantially as and for the purposes set forth.

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Witnesses:

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WM. J. ROBERTSON.