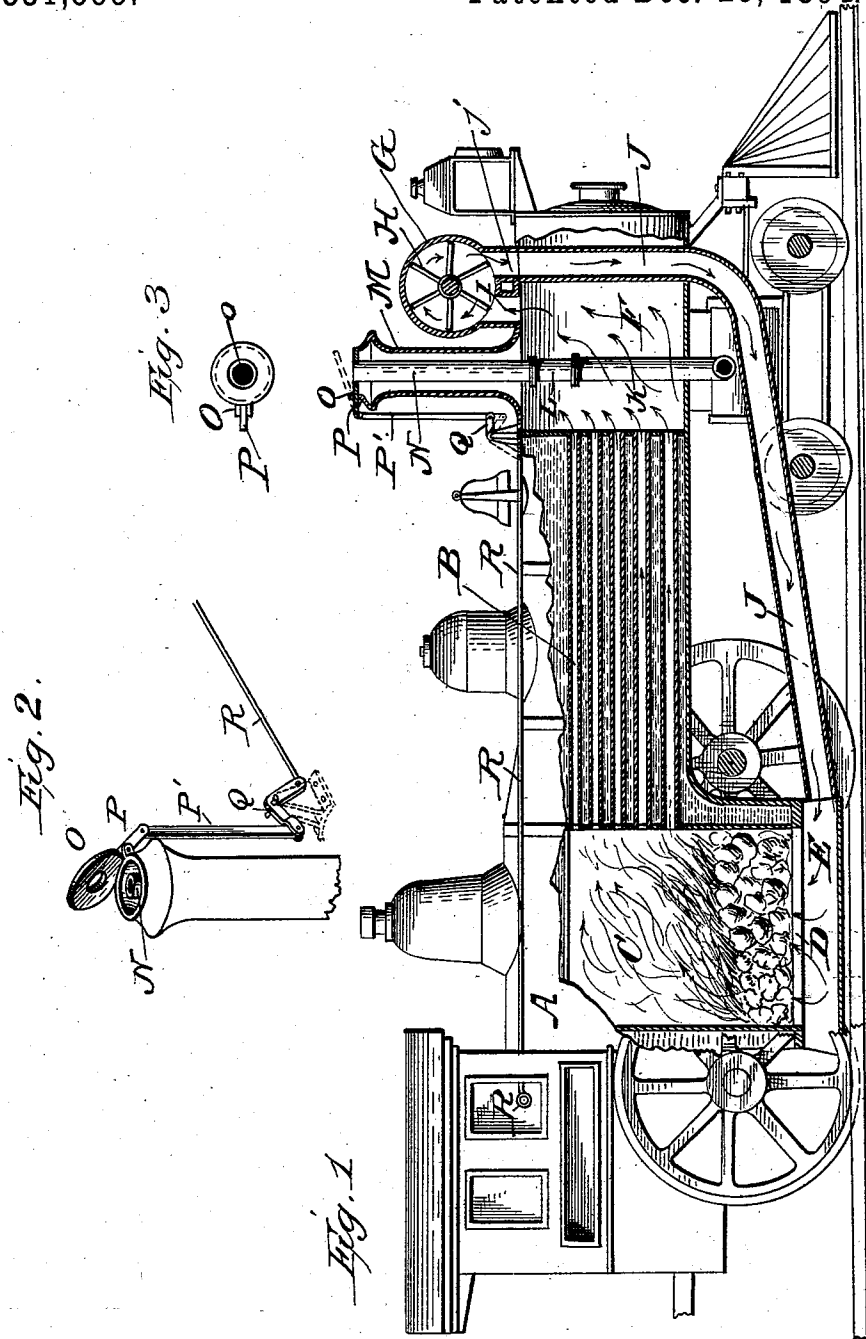


(No Model.)

F. C. McNALLY.
SMOKE CONSUMING LOCOMOTIVE.

No. 531,555.

Patented Dec. 25, 1894.



WITNESSES:
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UNITED STATES PATENT OFFICE.

FRANK CHARLES McNALLY, OF KANSAS CITY, MISSOURI.

SMOKE-CONSUMING LOCOMOTIVE.

SPECIFICATION forming part of Letters Patent No. 531,555, dated December 25, 1894.

Application filed May 7, 1894. Serial No. 510,366. (No model.)

To all whom it may concern:

Be it known that I, FRANK CHARLES McNALLY, a citizen of the United States, residing in Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Smoke-Consuming Locomotives; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, in which—

Figure 1 represents a longitudinal sectional view on a vertical plane through the middle of a locomotive of my improved construction. Fig. 2 is a detail view, in perspective, of the smoke-stack and its cover, with the mechanism for operating the same; and Fig. 3 is a plan view of the smoke-stack cover.

Like letters of reference designate corresponding parts in all the figures.

This invention relates to locomotives which consume their own products of combustion, (called sometimes "smokeless locomotives,") of that type which are provided with a revolving fan-blower for creating a forced draft and returning the smoke and cinders from the smoke-box to the fire-box, instead of permitting them to escape into the open air; and my improvement consists in the novel construction and combination of the fire-box, the smoke or cinder-box, the revolving fan, the engine exhaust, the smoke-stack, and a valve for regulating the draft through the same; substantially as will be hereinafter more fully described and claimed.

On the accompanying drawings, the reference-letter A denotes the boiler and B the flues of a locomotive of any approved construction.

C is the fire-box; D, the grate for the same, and E the ash-pan, which is adapted to be closed in on all sides, forming what is known as a "closed" ash-pan.

The flues B extending from the fire-box, open up into the smoke-box or cinder-box F, as usual; and above this is located a circular fan-chamber G, within which the rotary fan or blower H revolves. A short pipe, I, connects the fan-chamber G with the top of

the smoke-box upon which said chamber is mounted; and a longer pipe, J, extends from the outlet or exhaust-opening *j*, in the bottom of the fan-chamber vertically down through (or outside of) the smoke-box, and, below the same, is bent or deflected underneath the engine and boiler, terminating in the forward end of the closed ash-pan E, as clearly illustrated on the drawings.

The usual bifurcated exhaust-pipe K, which carries the exhaust from the steam-cylinders into the smoke-stack, shown at N, is provided at its upper end with a detachable coupling-sleeve L, by means of which it is connected to another vertical pipe M, which passes up through the middle of the smoke-stack to the open top of the same, which is provided with a hinged valve or damper O having a bent arm P, P', on one side, connected to a horizontal rod R by means of an intervening bell-crank Q. Rod R extends back into the cab of the locomotive, so as to be within easy reach of the engineer, and by pushing this rod, the damper may be opened, as indicated in dotted lines, while the damper is lowered and closed by pulling on rod R. The damper O, which is of such size and shape that it will fit closely over the open top of the smoke-stack, has a central circular aperture *o*, corresponding in diameter to the size of the vertical exhaust-pipe M, so that when the damper is in its "down" position or closed, the exhaust from the engine-cylinders will always remain open.

From the foregoing description, taken in connection with the drawings, the operation of my combined forced-draft and smoke-consuming device will readily be understood.

The fan H may be revolved either by a small separate engine, taking steam from the locomotive boiler, or by means of a belt-pulley on its axle connected to a pulley on the axle of one of the truck-wheels or drive-wheels. In first starting a fire to get up steam, damper O is left open to produce a natural draft, but when the locomotive is running, the damper is closed and the fan-blower H is started revolving in the direction indicated by the arrow. The current of air thus produced draws the cinders and gaseous products of combustion from the smoke box F up through pipe I into the fan-chamber G,

from which they are expelled through pipe J and carried back into the closed ash-pan E, and then up through the grate D into the mass of burning fuel in the fire-box C, where
 5 the inflammable gases and solid products of combustion are consumed; thereby not only doing away with all visible smoke and the escape of cinders through the smoke-stack, but economizing fuel by utilizing the gases and
 10 solid finely-diminuted products of combustion, which usually are permitted to escape into the open air.

If the fan-blower should accidentally break or get out of order, valve O is opened and the
 15 vertical exhaust-pipe M, within the smoke-stack, is removed by uncoupling and disconnecting the detachable connecting-sleeve L from the top of the bifurcated exhaust-pipe K; the door to the ash-pan E being opened at
 20 the same time. This permits of the locomotive being run in the usual manner, exhausting the products of combustion through the smoke-stack until the necessary repairs can be made, so that a locomotive of my improved
 25 construction cannot be disabled by accidents happening to the forced-draft fan or the mechanism for operating it.

Having thus described my invention, I

claim and desire to secure by Letters Patent of the United States—

In a smoke consuming locomotive, the combination with the fire-box, the closed ash pan, the smoke or cinder box, the fan chamber G, having an inlet I from the smoke box, and outlet j, the rotary fan blower H, the pipe J
 35 leading from the fan chamber to the ash pan, and the smoke stack, of the bifurcated steam exhaust pipe K provided with the detachable coupling sleeve L, the exhaust pipe M, connected with said coupling located in and concentric with the smoke stack, with its upper
 40 end flush with the upper end of said stack, the damper hinged to said stack and having a central aperture and the flexible connection leading therefrom to the cab, the construction being such that when said damper
 45 is closed it will close the top of the smoke stack, but leave the exhaust pipe M open, substantially as specified.

In testimony that I claim the foregoing as
 50 my own I have hereunto affixed my signature in presence of two witnesses.

FRANK CHARLES McNALLY.

Witnesses:

ISAAC B. MARLATT,
 JOHN H. YOUNG.