(No Model.)

G. Y. SMITH.

CINDER HOPPER.

No. 349,009. Patented Sept. 14, 1886.

Fig. 1.

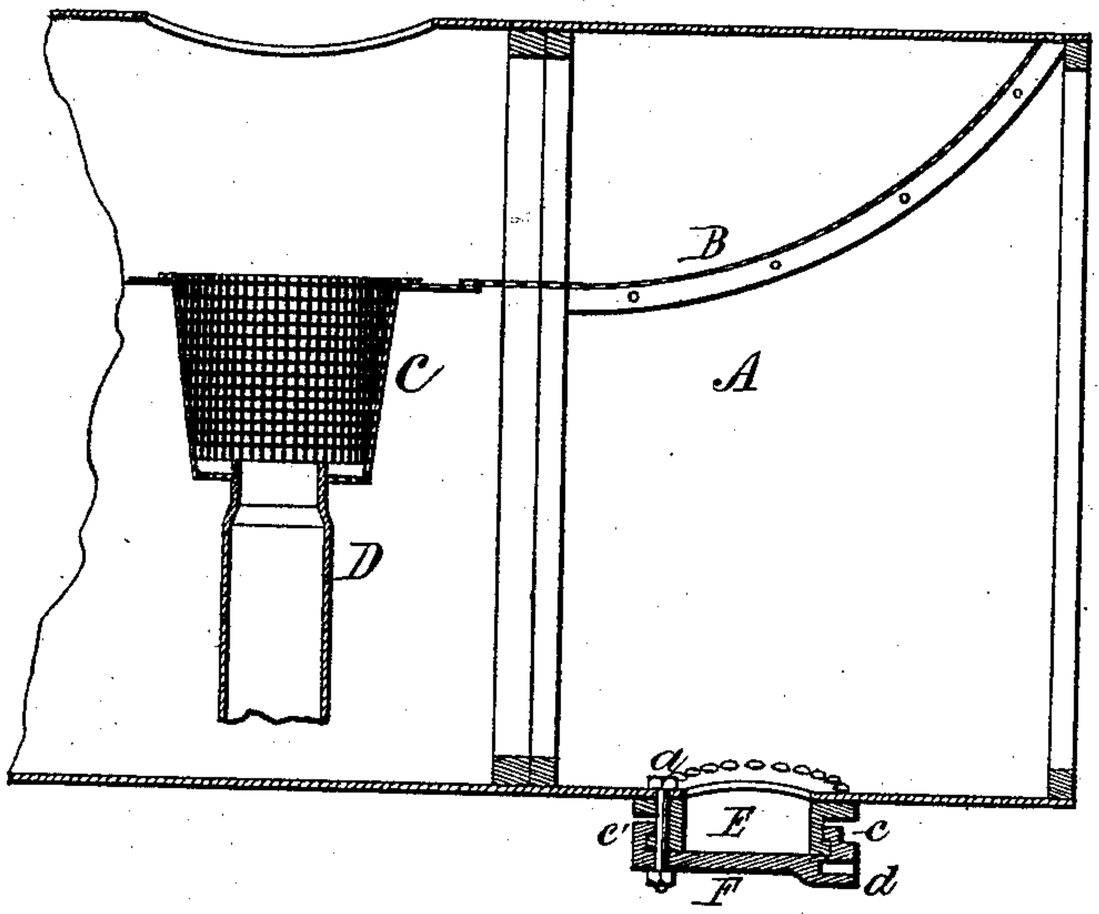


Fig. 2.

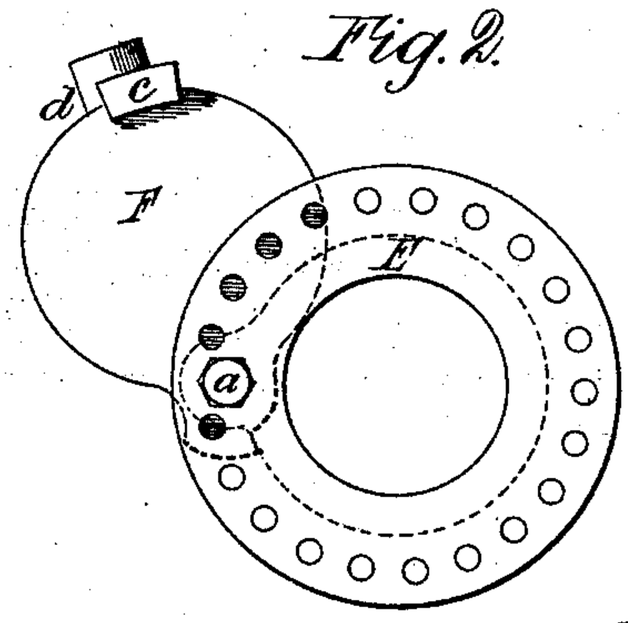


Fig. 3.

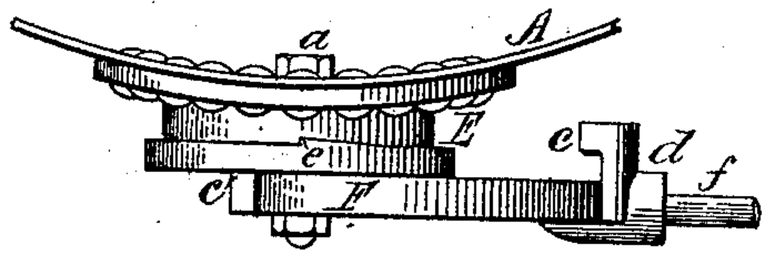
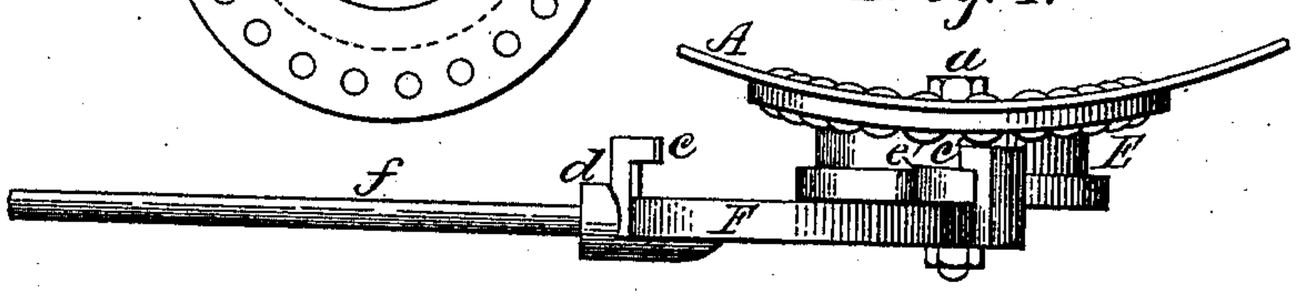


Fig. 4.



Witnesses.
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Frank G. Clark

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By Justus M. St. John,
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UNITED STATES PATENT OFFICE.

GEORGE Y. SMITH, OF CEDAR RAPIDS, IOWA.

CINDER-HOPPER.

SPECIFICATION forming part of Letters Patent No. 349,009, dated September 14, 1886

Application filed July 13, 1886. Serial No. 207,852. (No model.)

To all whom it may concern:

Be it known that I, GEORGE Y. SMITH, a citizen of the United States, residing at Cedar Rapids, in the county of Linn and State of Iowa, have invented certain new and useful Improvements in Cinder-Hoppers, of which the following is a specification.

My invention relates to that class of devices attached to the front end of steam-boilers by means of which the cinders accumulating therein are emptied; and the object of the invention is to produce a simpler, safer, and more convenient device for that purpose than those in common use.

The invention consists in the construction and adaptation of devices to this end, as will be hereinafter fully set forth and described.

In the accompanying drawings, forming a part of this specification, Figure 1 represents a longitudinal section of the front end of a boiler and of the hopper attached thereto; Fig. 2, a plan view of the hopper open; Fig. 3, a front elevation of the same, and Fig. 4 a rear elevation thereof.

Similar letters of reference indicate corresponding parts.

The cinder-hopper applied to most boilers, and particularly locomotive-boilers, is but imperfectly adapted to the object in view, being difficult to open and close, and causing unnecessary delay and vexation. Furthermore, because of its imperfect character, there is often a failure to close it tightly, and the air being admitted fires the cinders and causes serious injury to the boiler. These and other objections to the common cinder-hopper this invention is designed to remove.

The invention is quite simple, and will be apparent from a reference to the drawings.

In Fig. 1, A indicates the front end of the boiler, B a wire-netting, C the "basket," and D the "exhaust-nozzle," which are of the usual construction, and need not be further described. Beneath this netting is placed the hopper for the escape of the cinders at the proper time.

E is a doubly-flanged annular casting, the upper side conforming to the curvature of the boiler, to which the flange is fastened by suitable rivets. The lower flange has a semicircular lateral projection, through which passes a pivot-bolt, *a*. On the upper side this projection is provided with an annular or partially annular cam or incline, *e'*, and a similar incline is formed on the narrower flange opposite, *e*. The bottom face of the casting E is made perfectly plane, and to it is attached by the bolt *a* the gate F. The superficial outlines of these parts are indicated in Fig. 2.

To that side of the casting F connecting with the projecting portion of the other is formed a still farther projecting lug, *c*, the upper portion of which returns inwardly, engaging, when in connection, with the flange of the casting E. A similar lug on the opposite side of the gate engages with the other side of casting E in the same manner.

The upper face of the gate is made plane, so as to match tightly with the bottom of its fellow, and form a close joint when closed.

Connected with the lug *c* is an enlargement of the casting, forming a socket for a rod, *f*, by which the gate is opened and closed.

The operation of the device will now be seen. By the turning of the gate upon its pivot *a* the lugs *c c'* are brought into engagement with the cams *e e'*, and the parts E and F are brought into close contact when the gate is shut. Contrariwise, the opposite movement of the gate tends to loosen the connection of the parts, and the opening of the gate is easily and quickly made as soon as started. By making the joint at the pivotal side sufficiently tight it might be possible to dispense with the tightening lug and cam there; and I claim the invention of the apparatus, whether provided with one or two lugs and cams, but still regard the double tightening device as better, as it allows the gate to swing back freely as soon as started, and the tight closing of the parts does not depend upon the tightness of the pivot-bolt nor the strength thereof.

The invention described is peculiarly adapted to the ends in view. Its construction is such as to prevent the cinders from getting between the parts and opening the joint for the admission of air, since the operation of closing the gate itself scrapes clear from the contiguous faces any dust or grit that may have adhered to them, and leaves the joint always clean and perfect. The facility with which the hopper may be opened and closed is also an important feature, allowing the locomotive to make much better time than in cases

where the cinders are emptied by the ordinary means. The bar *f* is detached, except in the operation of opening and closing.

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

1. In a cinder-hopper, the cinder-hole iron E, having an inclined flange, *e*, opposite the pivot-bolt *a*, in combination with the gate F, having the lug *c*, substantially as and for the purpose set forth.

2. In a cinder-hopper, the cinder-hole iron E, having a semicircular lateral projection at one side, provided with an inclined portion on its upper side, and a reverse cam on the upper side of the flange opposite, in combination with the gate F, having the lateral inwardly-returning lugs *c c'*, all substantially as and for the purpose set forth.

3. In a cinder-hopper, the combination of the cinder-hole iron E, as described, the gate F, having the lugs *c c'* and the socket *d*, and the detachable bar *f*, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE Y. SMITH.

Witnesses:
FRANK G. CLARK,
D. V. M. LECRON.