(No Model.) 4 Sheets—Sheet 1.

# E. FALES.

## DEVICE FOR FEEDING FUEL TO FURNACES.

No. 342,082. Patented May 18, 1886.

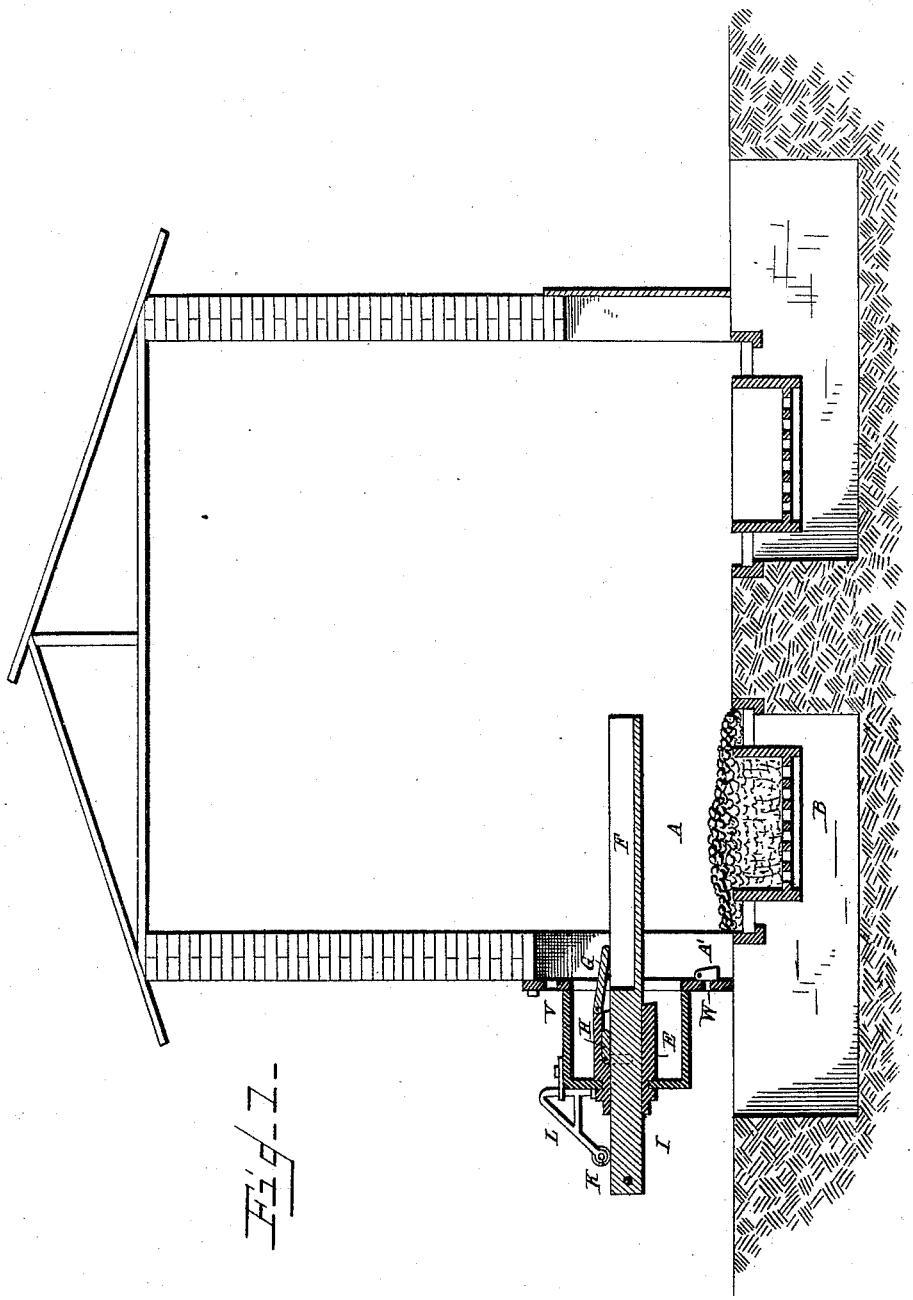


Fig. 1.

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N. W. Adams

Inventor
Edward Fales
By his Attorney
D. W. Linsabaugh

(No Model.) 4 Sheets—Sheet 2.

# E. FALES.

## DEVICE FOR FEEDING FUEL TO FURNACES.

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Fig. 3.

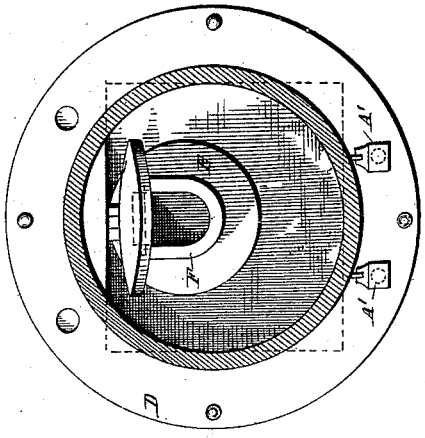
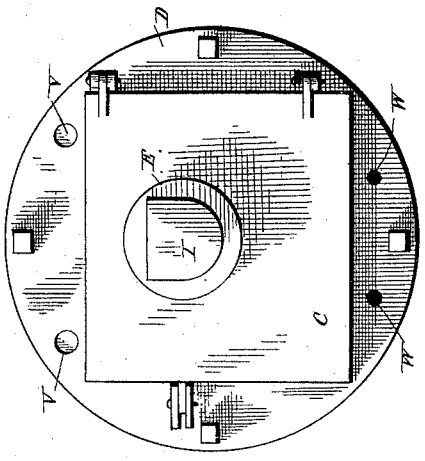


Fig. 4.

Fig. 2.



Witnesses
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(No Model.) 4 Sheets—Sheet 3.

# E. FALES.

## DEVICE FOR FEEDING FUEL TO FURNACES.

No. 342,082. Patented May 18, 1886.

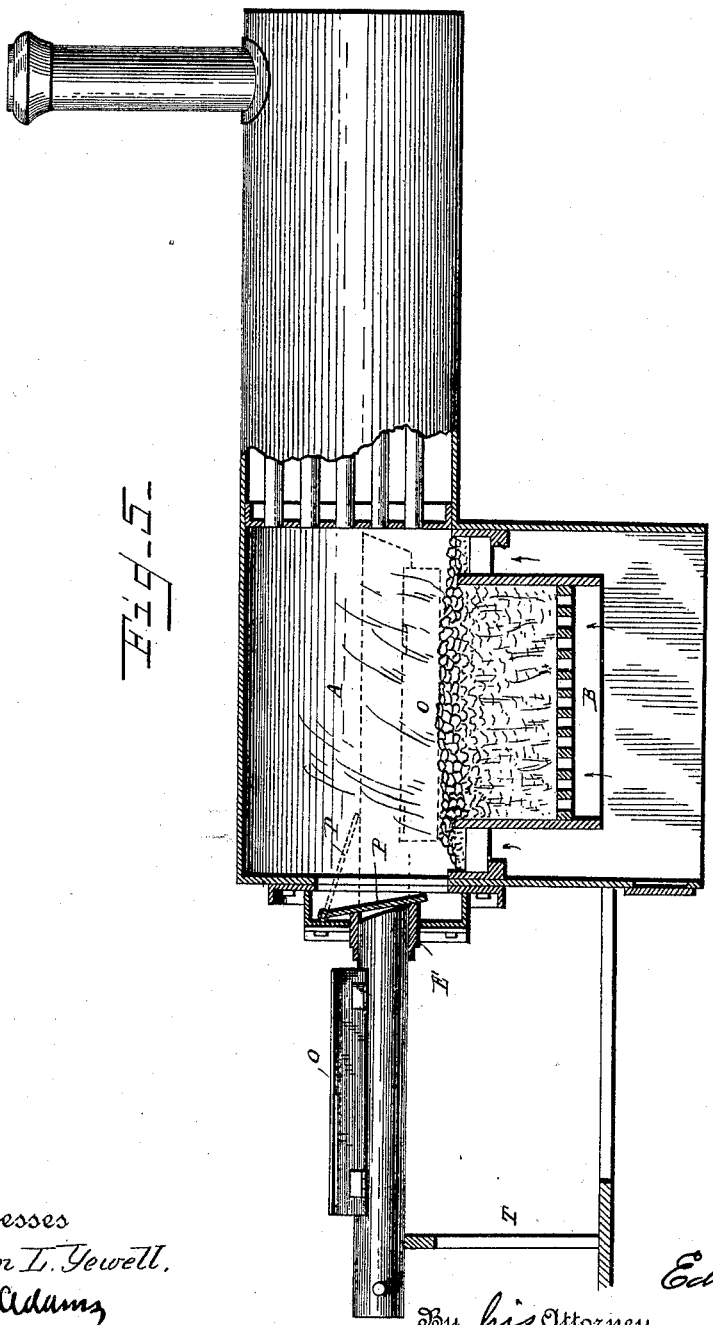


Fig. 3.

Witnesses
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(No Model.) 4 Sheets—Sheet 4.

# E. FALES.

## DEVICE FOR FEEDING FUEL TO FURNACES.

No. 342,082. Patented May 18, 1886.

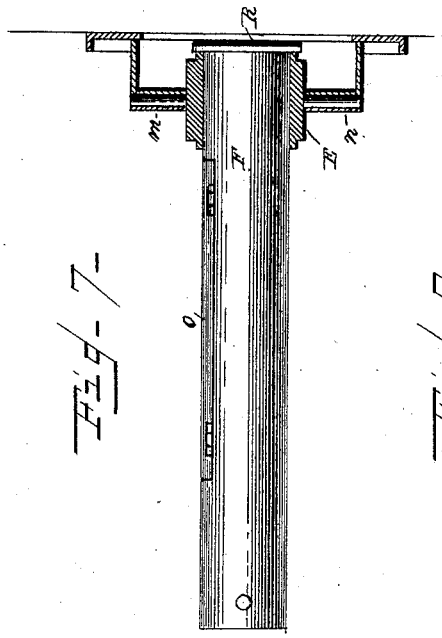

Fig. 7.

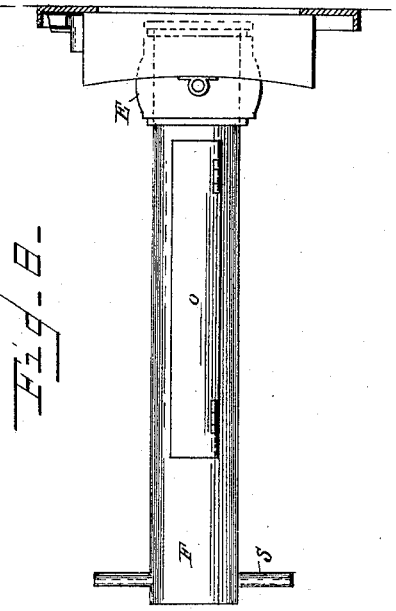

Fig. 8.

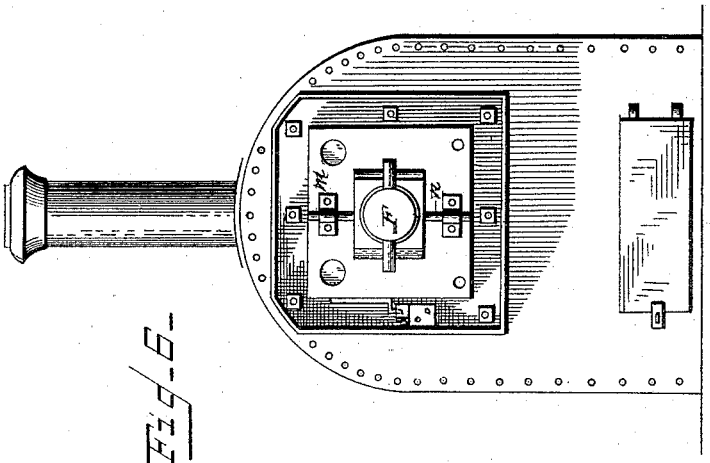

Fig. 9.

Witnesses

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F. D. Brass.

Inventor

Edward Fales

By his Attorney

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# UNITED STATES PATENT OFFICE.

EDWARD FALES, OF ST. LOUIS, MISSOURI.

## DEVICE FOR FEEDING FUEL TO FURNACES.

SPECIFICATION forming part of Letters Patent No. 342,082, dated May 18, 1886.

Application filed February 15, 1886. Serial No. 191,968. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD FALES, a citizen of the United States, residing at St. Louis, in the county of St. Louis and State of Missouri, have invented certain new and useful Improvements in Devices for Feeding Furnaces with Fuel, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in devices for feeding fuel to furnaces.

The object of my invention is to feed the fuel in uniform quantities to all parts of the furnace in such a manner that cold drafts of air will not be admitted to the furnace above the fuel or body of the fire.

In the ordinary methods of feeding fuel to furnaces the doors are opened and the fuel thrown in through the open doors. As a natural consequence, cold drafts of air are admitted, which not only check the intensity of the flame, but chill the furnace, and in steam-boiler furnaces the steam runs down, and the sudden contractions and expansions of the flues, &c., incident to these sudden changes do great injury to the boiler. Besides, a vast amount of heat is wasted in bringing the furnace to the same degree of temperature it was in before the doors were opened.

In the drawings, Figure 1 is a longitudinal sectional view of my feeding device as applied to a brick-kiln. Fig. 2 is a front view of the furnace-door with the charger inserted. Fig. 3 is a rear view of the furnace-door with the charger inserted. Fig. 4 is a view in perspective of one form of charger. Fig. 5 is a side elevation, partly in section, of a steam-boiler in which the charger is a modification of the one shown in Fig. 5. Fig. 6 is a front view of the steam-boiler and furnace shown in Fig. 6. Fig. 7 is a side view of a cylindrical charger having a door in one side thereof. Fig. 8 is a plan or top view of the devices shown in Fig. 8.

A indicates the furnace or combustion-chamber, which may be of any desired form or structure, and B indicates the grate, which also may be of any devised form; but I prefer to use the fire-pot grate shown in the drawings, for the reason that better results can be obtained from the use of it and a more perfect combustion insured.

The fire-pot or grate B forms the subject-matter of an application filed by me December 22, 1885, Serial No. 186,454, and need not be further described or referred to in this application.

C is the door, which is hinged to or secured to a suitable cast-iron frame, D, as shown in Fig. 2, in which is located the tube or sleeve E, through which the charger F is inserted to feed the fuel to the furnace.

The tube or sleeve E is placed in the door C, so that it can be readily turned around, and is provided with a hinged door, G, which falls and closes the inner end of the tube or sleeve E when the charger F is removed after having deposited its charge of fuel on the fire. The tube or sleeve E is also provided with a smaller or supplemental valve or door, H, which drops into the charger when the same is being removed from the furnace, and prevents the ingress of air into the furnace.

The charger F is made V-shaped in cross-section and adapted to fit within a corresponding recess in the tube or sleeve, so that when the charger is filled with fuel and pushed into the sleeve E the valved doors G and H will be raised, as shown in Fig. 1, and the charger pushed into the furnace as far as desired. After the charger has been pushed into the furnace as far as is necessary it is turned over, together with the tube or sleeve E, and after the charge of fuel has been deposited on the grate-bars or fire the charger and sleeve are turned into their original position and the charger drawn out of the sleeve or tube. The charger, after being inserted through the sleeve or tube into the combustion-chamber, may be tilted first to the right and then to the left, so as to throw the fuel to the sides of the furnace, or, if turned directly over, the fuel will be deposited near the center of the fire.

It may be proper to remark in this connection that the rear end of the charger is solid or closed to the top, as shown at I, so that the combustion-chamber will have no connection with the external air when the charger is inserted through the tube or sleeve E, and it will be noticed that when the charger has deposited its load and been turned back to the position shown in Fig. 1, and on being withdrawn from the tube or sleeve E, the door or valve H will drop into the cavity of the

charger, and thus prevent the air from the outside from rushing into the furnace above the grate, and as soon as the charger has been withdrawn the valve G will drop and close the inner end of the tube or sleeve E, and thus effectually prevent the entrance of external air into the furnace.

In some instances, where a long furnace is used, I make a portion of the charger solid or with a closed top, as shown at I, and employ a friction-wheel, K, which is mounted in the bracket L to press down on the top of the outer end of the charger, so as in a measure to relieve the tube or sleeve from strain caused by the weight of coal in the front end of the charger, and at the same time provide means by which the operator can readily manipulate the charger whether it is filled with fuel or not.

In Figs. 5, 6, 7, and 8 I have shown a modification of my fuel-charger, and in this case the tube or sleeve E does not revolve, but is pivoted, as shown at M N, and adapted to be turned to the right or left on these pivots, so that the fuel can be deposited to one side or the other of the furnace. In this instance, also, the charger F is adapted to be turned in the tube or sleeve E so as to deposit the fuel through the door or opening O on the fire in the furnace, and in this instance the inner end of the charger is closed, so that the outside air cannot rush into the combustion-chamber.

As before intimated, the charger shown in Figs. 5, 6, 7, and 8 is provided with a door, O, which is raised or opened when the charger is being filled, but closed before the charger is pushed into the combustion-chamber, and when said charger is pushed into the combustion-chamber over the fire it is turned into the position shown in dotted lines in Fig. 5, when the door will open and allow the fuel to be deposited onto the fire, after which the charger is turned so the door O will close when it is drawn back and in position to be refilled with fuel. The charger shown in Fig. 5 is adapted to be withdrawn from the tube or sleeve E, a door or valve, P, being hinged above the tube E, so as to close the same when the charger is removed therefrom. The charger shown in Figs. 7 and 8 is not adapted to be removed from the sleeve E, but is provided with a cap, R, which closes the opening in the sleeve or tube E when the charger is drawn back.

The charger F, just described, and as shown in Figs. 5, 6, and 7, is provided with handles S, so it can be readily turned by the operator after it has been pushed into the combustion-chamber, and the rear end of said charger is supported by a prop, T, which relieves the tube or sleeve of all strain while the charger is being filled with fuel.

V are peep-holes located in the upper portion of the casing D, and are closed with mica or other suitable material.

W are poke-holes located in the lower portion of the casing D, said holes being closed on the inside of the casing by the pivoted valves or doors A′, said valves being composed of a heavy casting having the side next the casing perfectly straight, so as to fit closely against the inside of the said casing. These valves or doors are arranged to open inward toward the fire when the poker is inserted, but will return again to their normal position and close the openings W when the poker is removed.

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

1. In devices for feeding fuel to furnaces, a trough or cylinder adapted to be inserted through a valved opening in the furnace-front and to be turned to deposit the fuel on the fire, as set forth.

2. In devices for feeding fuel to furnaces, a movable sleeve, E, fitted in the furnace-front, and a charger adapted to be inserted in said sleeve and turned to deposit the fuel on the fire, as set forth.

3. In devices for feeding fuel to furnaces, the sleeve or tube E, provided with the valves G and H, in combination with the charger F, as set forth.

4. In devices for feeding fuel, the sleeve E, mounted in the furnace-front and adapted to be moved as described, said sleeve being provided with a valve for closing its inner end, and a supplemental valve, H, adapted to fit within the cavity of the charger when the same has been freed of its charge of fuel, whereby the external air is prevented from entering the furnace, as set forth.

5. In devices for feeding fuel to furnaces, the charger F, having its rear portion closed or solid and adapted to fit snugly with the sleeve E, in combination with the bracket L and friction-roller K, as set forth.

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

EDWARD FALES.

Witnesses:
N. D. ADAMS,
F. D. BRASS.