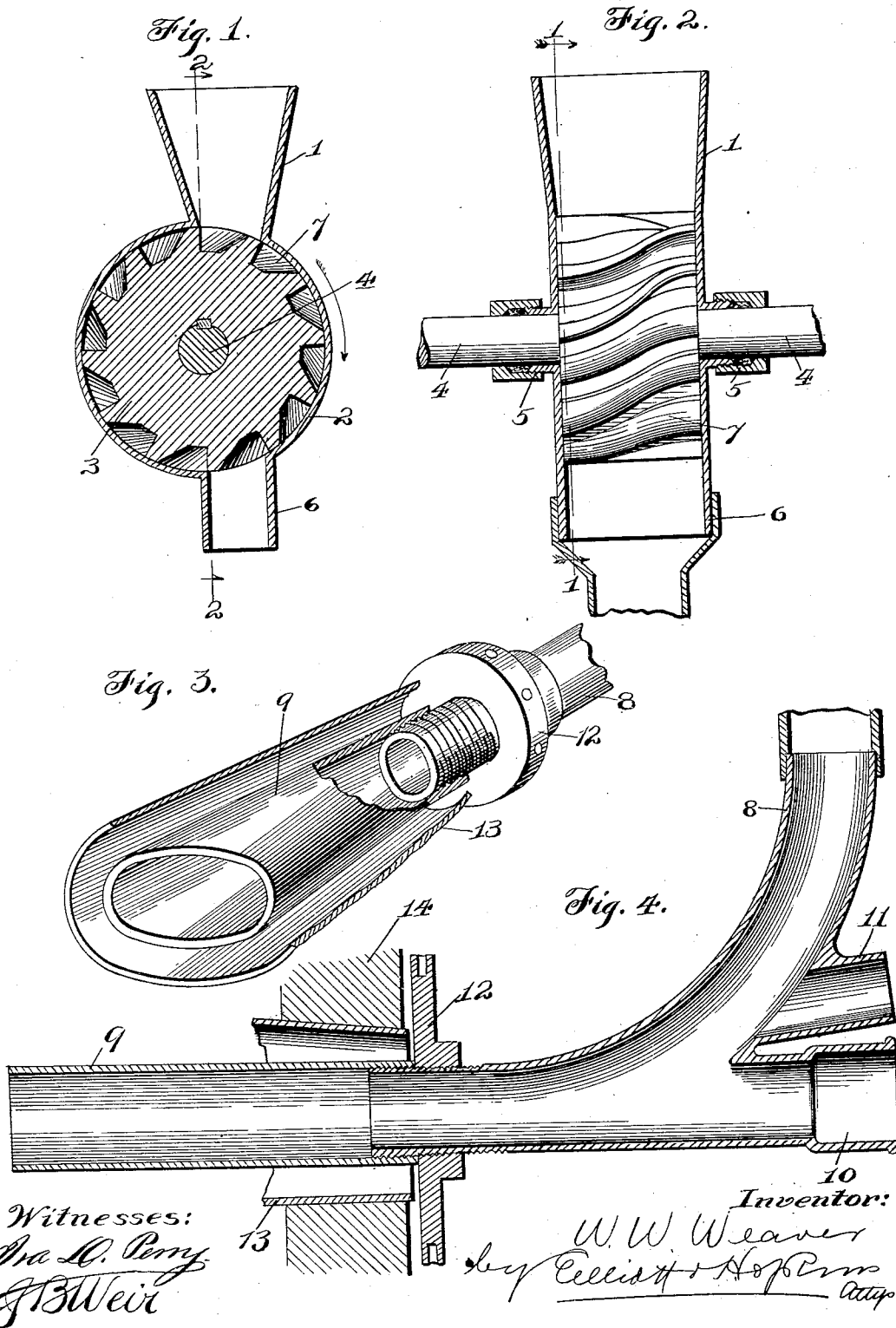


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W. W. WEAVER.
MEANS FOR STOKING FURNACES.
APPLICATION FILED DEC. 30, 1901.

NO MODEL.



UNITED STATES PATENT OFFICE.

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MEANS FOR STOKING FURNACES.

SPECIFICATION forming part of Letters Patent No. 738,133, dated September 1, 1903.

Application filed December 30, 1901. Serial No. 87,679. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. WEAVER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Means for Stoking Furnaces, of which the following is a full, clear, and exact specification.

This invention relates to the art of stoking furnaces, and more particularly to the art of stoking fine-fuel furnaces; and it has for its primary object to feed the furnace or the stoking-inlet thereof with a continuous supply of fuel and at the same time keep the store of fuel from which such supply is drawn permanently cut off from the stoking-inlet, whereby the amount passing into the furnace may be gaged and regulated to a nicety without danger of a surplus of fuel being drawn in by the forced fluid-fuel element, such as air or steam, usually employed in this art for injecting the fuel.

With these ends in view my invention consists in certain features of novelty hereinafter described, and shown in the accompanying drawings, by which the said objects and certain other objects hereinafter appearing are attained.

In the said drawings, Figure 1 is a transverse sectional view of the combined valve and measuring device, taken on the line 1 1, Fig. 2. Fig. 2 is a longitudinal sectional view thereof, taken on the line 2 2, Fig. 1. Fig. 3 is a perspective view, partly broken away, showing the nozzle and draft-regulator hereinafter described; and Fig. 4 is a vertical longitudinal sectional view thereof, showing the same in connection with a part of the furnace and the feed-neck of the nozzle.

1 is the hopper or the connection whereby the apparatus is secured to the hopper which contains the fuel, consisting ordinarily of pulverized coal or other finely-divided combustible, and 2 is a housing arranged below and communicating with the hopper or hopper-neck 1 and in which housing is situated a cylindrical valve 3. The valve is mounted upon a shaft 4, journaled in suitable stuffing-boxes 5 on the sides of the housing and pro-

jecting therefrom, so that it may be driven in any suitable manner from any convenient source of power, not necessary to illustrate. The housing 2, directly below the hopper-neck 1, is provided with an outlet-port 6, and the valve is so proportioned and arranged that it will at all times intercept communication between the neck or inlet 1 and the outlet 6. The periphery of the valve, however, is provided with a series of pockets 7, arranged lengthwise of the axis of rotation of the valve, so as to pass transversely and successively across the lower end of the neck 1 and the discharge-port 6, the valve being of cylindrical form and fitting snugly against the sides of the housing 2, so as to close the ends of the pockets 7 and cut off all communication between the inlet 1 and outlet 6, and hence as the series of pockets pass successively under the inlet 1 each will receive a charge of fuel, and the series of charges thus formed will be isolated or cut off from each other and also from the inlet 1 as soon as the pockets pass beyond said inlet, and as they come into register one by one with the outlet 6 they will discharge therethrough. In order that this feeding of the fuel from the inlet 1 to the outlet 6 may be substantially continuous, the pockets 7 are arranged diagonally with reference to the outlet 6, which in the example of the invention shown in the drawings is a narrow elongated opening extending the full length of the valve 3 and arranged parallel with its axis of rotation, so that the pocket 7 will approach it end on, and consequently each will discharge there- through gradually; but these pockets are lengthwise in form, and to this end preferably curved, as shown, and so arranged with relation to each other that the forward end of one will be substantially as far advanced in the line of rotation as the rear end of the next preceding one, and as a consequence before the preceding one shall have fully discharged through the outlet 6 the next succeeding one will have commenced to discharge. It will be seen, therefore, that by this arrangement of pockets and port the feeding of the fuel to the furnace will be in the form of a continuous stream and

at the same time direct communication between the main supply or store above the valve, and the inlet to the furnace will be permanently intercepted and the amount being
 5 fed into the furnace may be gaged to a nicety by regulating the speed of rotation of the valve.

The fuel as it falls through the discharge-port 6 may be driven into the furnace in any
 10 suitable way, but preferably by means of a forced current of some fluid-fuel element under pressure, such as compressed air or steam, and when this is to be done I preferably employ the form of nozzle apparatus shown in
 15 Figs. 3 and 4, which is provided with a feed-neck 8, into which the discharge-port 6 is fitted. This feed-neck 8 is formed on a gradual downward curve and attached to a nozzle 9, adapted to be inserted through the wall of
 20 the furnace, and at the lower side of the neck is formed an inlet 10 for forcing the current of air, steam, or other fluid-fuel element and which inlet is so arranged with relation to the neck 8 as to draw the fuel falling into the
 25 neck downwardly and force the same into the furnace through the nozzle 9.

In order that the fuel may not bank at the point of intersection of the connection 10 and the curved neck 8, a supplemental inlet 11 is
 30 provided, and this is directed slightly downwardly toward the inlet 10, but is of smaller caliber than the latter inlet, so that the inlet 10 will induce the fuel to come down in front of the inlet 11, whose current will in turn propel it by its dynamic force into the path of
 35 the current passing through the inlet 10, while at the same time inducing more or less suction in the neck 8 above the inlet 11.

The lower end of the neck 8 is provided
 40 with a damper or draft-regulator 12, which is preferably screw-threaded thereon, so that it may be backed off and accurately adjusted with relation to an air-inlet nozzle or casing 13, which is supported in the masonry 14 or
 45 other part of the furnace-wall and surrounds the nozzle 9, the outer end of the casing 13 communicating with the open atmosphere and bearing such relation to the damper 12 that the latter may be screwed up accurately
 50 against it, so as to shut off all draft from the casing 13 or back it off any desired distance for increasing such draft, the damper 12 being screw-threaded on the neck 8 which may be adjusted to a nicety and will maintain its
 55 adjustment.

Having thus described my invention, what

I claim as new therein, and desire to secure by Letters Patent, is—

1. In an apparatus for the purpose described the combination of a valve-housing
 60 having a discharge-port and means for communication with a store of fuel, a valve in said housing permanently closing communication between said port and means, and having
 65 disconnected tortuous pockets adapted to register with said port, said pockets being so relatively arranged that the forward end of one will be as far forward with reference to
 70 said port as the rear end of the next preceding one, substantially as set forth.

2. In an apparatus for the purpose described the combination with a valve-housing
 75 having a discharge-port and means for communication with a store of fuel, a valve in said housing permanently closing communication between said port and means, and having
 80 disconnected diagonally-arranged tortuous pockets adapted to register successively with said port and means for moving said valve, substantially as set forth.

3. In an apparatus for the purpose described the combination of a valve-housing
 85 having a discharge-port and means for communication with a store of fuel, and a cylindrical rotary valve having tortuous peripheral pockets, said pockets and port being so
 90 arranged that one will be lengthwise of the other at an angle to the axis of rotation of said valve, substantially as set forth.

4. In an apparatus for the purpose described the combination with a pipe-passage
 95 connected at one end with a furnace, means for depositing fuel in the other end of said passage, a fluid-pressure inlet directed into the outlet end of said passage, and a supplemental
 100 fluid-pressure inlet of less diameter directed into said passage at a point above the outlet thereof, substantially as set forth.

5. In an apparatus for the purpose described the combination of a passage for fuel
 105 adapted to be connected with a furnace, means for depositing fuel in said passage, a fluid-pressure inlet directed into the outlet of said passage for drawing fuel therethrough, and a supplemental fluid-pressure inlet directed
 110 into said passage above and in advance of and at an acute angle to first said fluid-inlet, substantially as set forth.

WILLIAM W. WEAVER.

Witnesses:

W. D. CROSS,
 F. A. HOPKINS.