

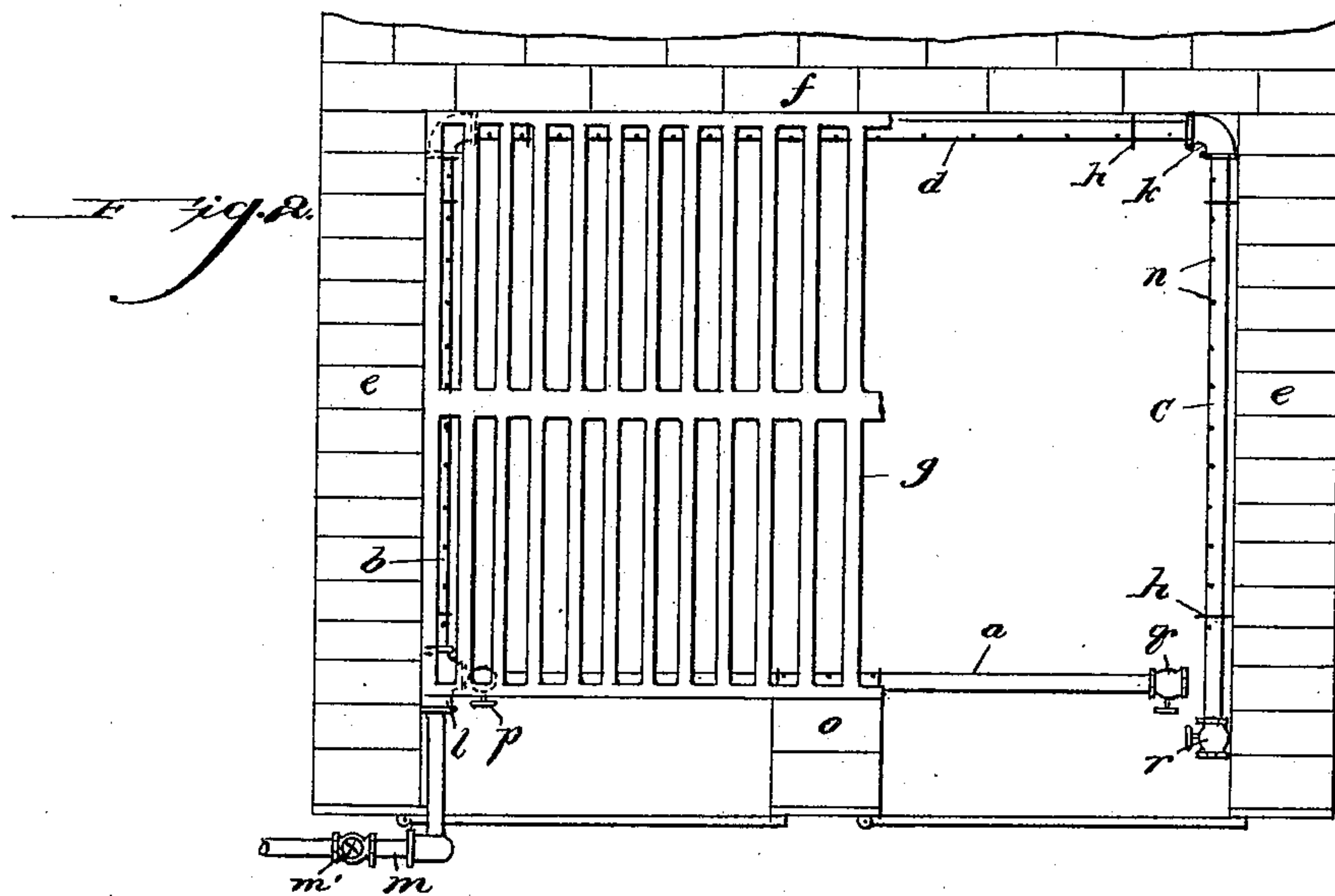
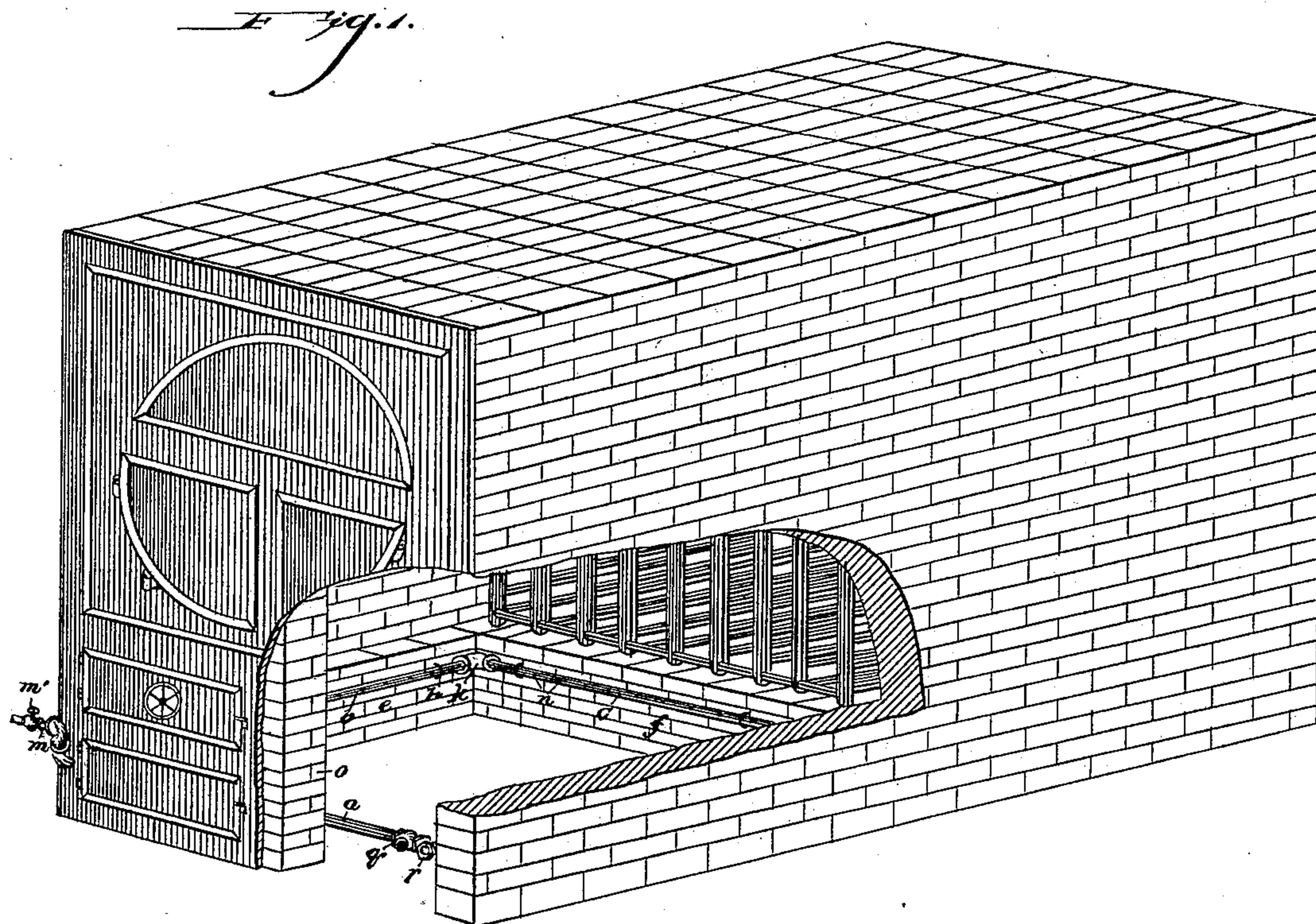
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Patented Dec. 27, 1898.

J. A. SNYDER & G. H. HEITZMAN, JR.
FURNACE.

(Application filed Apr. 8, 1898.)

(No Model.)



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JOHN A. SNYDER AND GEORGE H. HEITZMAN, JR., OF PITTSBURG,
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FURNACE.

SPECIFICATION forming part of Letters Patent No. 616,742, dated December 27, 1898.

Application filed April 8, 1898. Serial No. 676,907. (No model.)

To all whom it may concern:

Be it known that we, JOHN A. SNYDER and GEORGE H. HEITZMAN, Jr., citizens of the United States of America, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Furnaces, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in furnaces; and it relates particularly to a device by means of which steam is projected along the walls of the furnace so as to prevent the accumulation of cinders or clinkers upon said walls, while at the same time assisting in the increasing of the draft and promoting a more perfect combustion within the combustion-chamber. To accomplish these results, we arrange beneath the grate-bars of the furnace a perforated pipe which extends along each wall of the furnace and is connected by a supply-pipe to the dome of the boiler or at another suitable point, so that live steam may be fed regularly into the said perforated pipe. On that portion of the pipe which extends along the front of the furnace we may provide the same with perforations only in front of the dome, so that no steam will escape from the pipe at a point adjacent to the furnace-bars. We also prefer to provide the two ends of the perforated pipe with blow-off cocks, so that in event of the said pipes becoming clogged these cocks may be opened and an increased force of steam turned into the perforated pipe, so as to drain the sediment therefrom. We also provide the said front pipe with a cock or valve, by means of which the steam may be shut off entirely from this pipe, if desired.

In most furnaces at the present time it is difficult to prevent the accumulation of clinkers upon the side and bridge walls, and these clinkers tend to injure the draft of the furnace, hindering the perfect combustion of the same, increasing the amount of fuel required to attain the desired heat, besides largely increasing the labor of firing a furnace, as well as increasing the cost of repairs, as the re-

moval of these clinkers necessarily injures the brickwork to a large extent, so that in a short time it is necessary to repair or replace the same. To overcome all these objections and to provide a device whereby the greatest possible combustion of fuel will be obtained, the draft will be strengthened, the smoke will to a large extent be consumed, a saving of fire-brick, a saving of labor and repairs, to attain a more easy working of the firing, to provide a device which will be noiseless in its operation, a device which will require but a small amount of space, and which may be applied to any furnace and which will be extremely simple in construction are the objects of our invention, and we will now more specifically describe the same by reference to the accompanying drawings, in which—

Figure 1 is a perspective view of the furnace, partly broken away, showing our improved fuel-consumer and clinker-remover in position. Fig. 2 is a top plan view of a portion of a furnace with the grate-bars partly broken away to show the arrangement of the perforated pipes.

To put our invention into practice, we provide the four pieces of pipe *a*, *b*, *c*, and *d*, said sections *b* and *c* being placed in close juxtaposition to the side wall *e* of the furnace, the section *d* being placed in a similar manner along the bridge-wall *f* of the furnace, and the section *a* being placed along the front of the furnace or directly underneath the grate-bars *g*. These sections of pipe are or may be secured to the said walls by means of staples *h* driven into the brickwork or masonry, or other desirable fastening means may be provided for same. The sections *b* and *c* are connected to the section *d* by means of the unions *k*, while the said section *b* at its other end and the section *a* are connected by a three-way union *l*, to which is also attached the supply-pipe *m*, which conducts the steam from the dome or other source of supply to the aforesaid pipes within the furnace. The sections *b*, *c*, and *d* are each provided throughout their length on their upper face with perforations *n*, which in the pipe *d* are so arranged that they will be directly between each of the grate-bars in order that the latter may

offer no resistance to the jets of steam emitted through the said perforations. The pipe or section *a* may be provided with these perforations at that portion of the pipe which is
5 in juxtaposition to the jambs *o* with the balance of the pipe unperforated, so that no steam will be projected therefrom directly in front of the furnace-doors. If desired, this pipe *a* may be provided with a controlling
10 valve or cock *p* in close relation to the union *l*, so that the steam may be entirely shut off from the pipe *a* if such may be found desirable. We also preferably provide the free end of the pipe or section *a* with a blow-off
15 cock or valve *q*, and provide the free end of the pipe or section *c* with a similar blow-off cock or valve *r*.

To regulate the quantity of steam admitted into the pipes, the supply-pipe *m* is provided
20 with a controlling valve or cock *m'*, which may be arranged in the position shown or at any other desired position upon the supply-pipe.

While the device is herein shown as applied
25 to a single furnace, it will of course be readily understood that it can be arranged to accommodate any number of furnaces, each being fed from the one common supply-pipe. In practice we have found that a very small
30 amount of steam admitted into the perforated pipes has been sufficient to keep the walls of the furnace entirely free from clinkers, and thereby tending to greatly increase the combustion within the furnace and decreasing the labor necessary to retain the desired
35 heat. The obviation of the clinkers accumulating upon the side and bridge walls has also been found to largely increase the life of the wall, as the work of removing the
40 clinkers necessarily damages the walls to a great extent, so that in a short time it is absolutely necessary to repair or remove the same.

By arranging the pipe that is in juxtaposi-
45 tion to the bridge-wall so that the perfora-

tions will come directly between the grate-bars no obstruction is offered to the steam emitted through said pipe.

In case the pipes should accidentally become clogged by sediment settling through the apertures thereof the opening of the blow-off cocks to the valve *l* and the increase of the steam-pressure by opening the valve *m'* will permit the ejection of all such sediment from the pipes. We have also found that by
55 such a construction the smoke is, to a great extent, consumed, as the hot blast from under the grate, passing up through the live coals, brings the clear flame into contact with the smoke when it reaches the bridge-wall, and thereby causes the same to be consumed.

Such a device can readily be applied to any form of furnace without in any manner interfering with the ordinary construction of
65 the same.

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

In combination with a furnace of pipes *a*, *b*, *c* and *d* connected together in substantially
70 a rectangular form within the furnace and below the grate-bars, the pipes *a* and *c* having a blow-off cock secured to their free ends, said pipes *b*, *c*, *d* being provided with perforations, at predetermined distances apart so
75 the same will be opposite the openings in the grate, a steam-supply pipe secured to an elbow connecting pipes *a* and *b*, said pipe *a* being provided with perforations at a central point, and a valve for regulating the supply
80 of steam, substantially as shown and described.

In testimony whereof we affix our signatures in the presence of two witnesses.

JOHN A. SNYDER.
GEORGE H. HEITZMAN, JR.

Witnesses:

A. M. WILSON,
JOHN GROETZINGER.