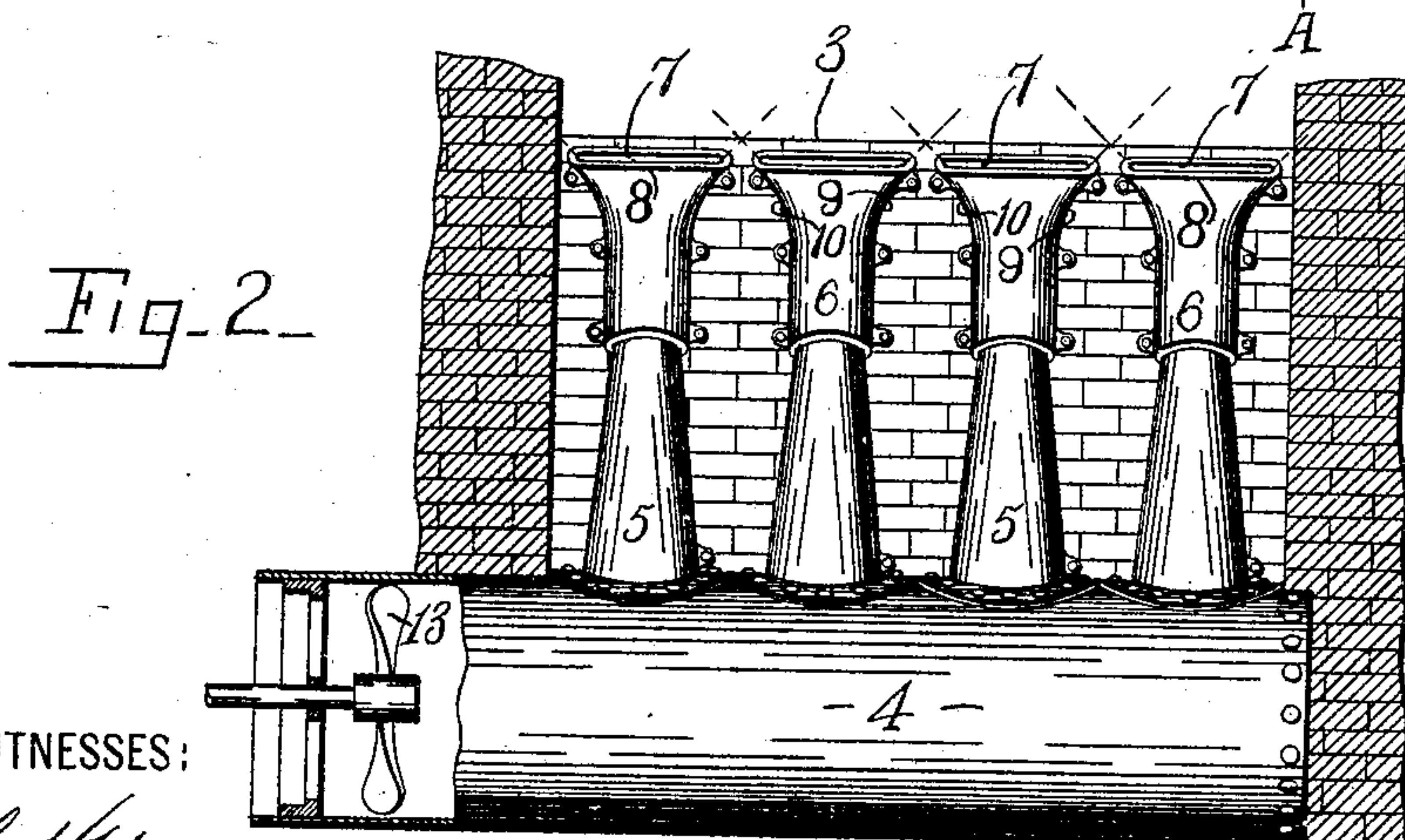
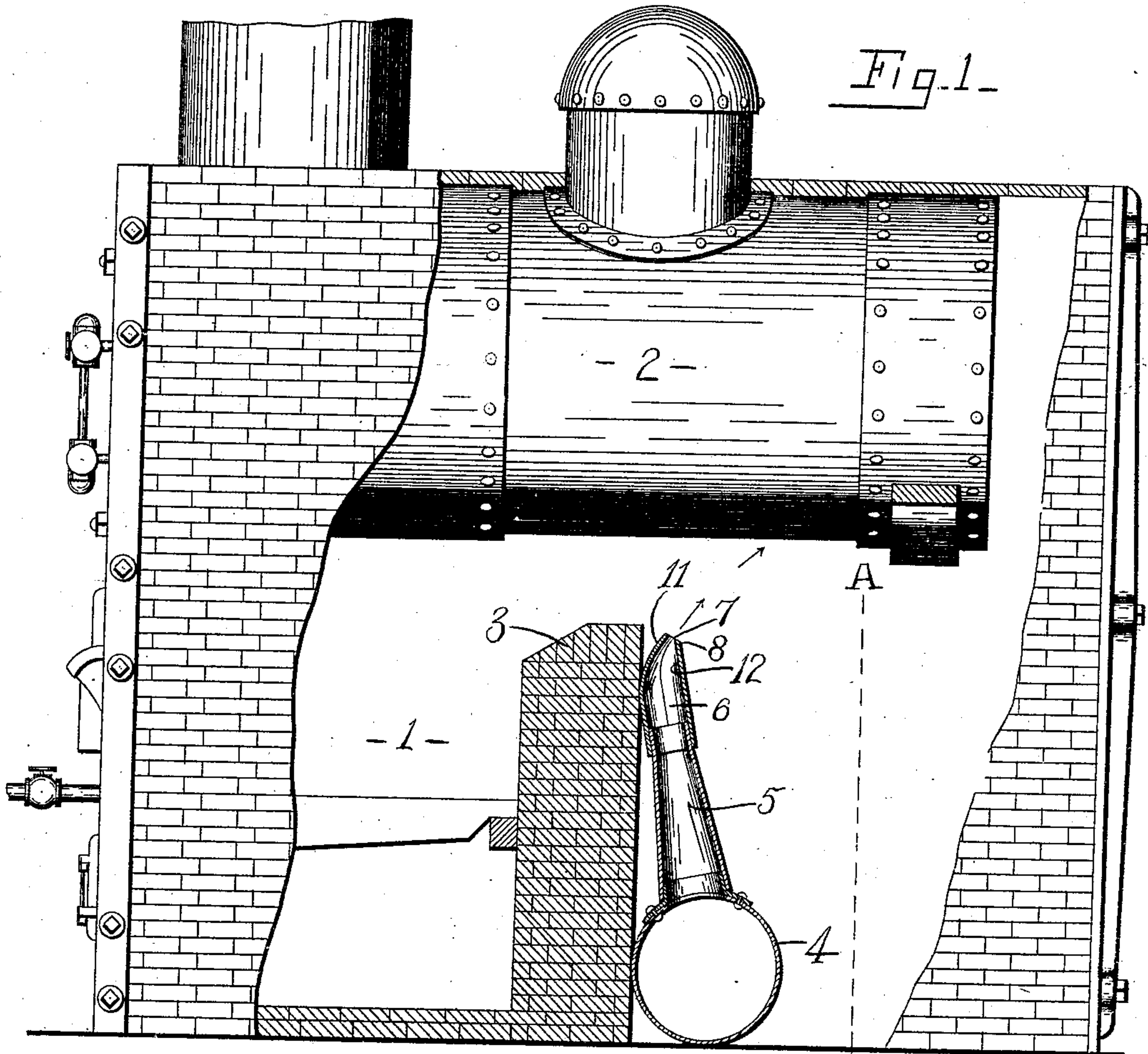


S. H. NORTH.
SMOKE CONSUMER.
APPLICATION FILED APR. 13, 1908.

934,415.

Patented Sept. 14, 1909.



WITNESSES:

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STEPHEN H. NORTH, OF SYRACUSE, NEW YORK.

SMOKE-CONSUMER.

Specification of Letters Patent. Patented Sept. 14, 1909.

934,415.

Application filed April 13, 1908. Serial No. 426,742.

To all whom it may concern:

Be it known that I, STEPHEN H. NORTH, of Syracuse, in the county of Onondaga and State of New York, have invented a certain new and useful Smoke-Consumer, of which the following is a specification.

My invention has for its object the production of a particularly simple and efficient smoke consumer which can be easily installed in a furnace of any construction or type; and to this end it consists in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawing in which like characters designate corresponding parts in all the views.

Figure 1 is a sectional view of a brick set boiler equipped with my smoke consumer. Fig. 2 is a sectional view on line A—A, Fig. 1.

1 is a furnace, 2 is a flue boiler, 3 is the bridge wall of the furnace, all of which parts may be of desirable form, size and construction and form no part of this invention.

This invention comprises means for forming and directing a sheet of air into the path of the products of combustion passing from the furnace. In the illustrated embodiment of this invention, in which is shown a brick set flue boiler, the products of the combustion pass from the fire chamber over the bridge wall 2 through the combustion 3 in rear of the bridge wall, and then through the flues of the boiler 2 in the ordinary manner.

The means for forming and directing the sheet of air into the path of the products of combustion passing from the furnace, comprises a main conduit 4 extending crosswise of the furnace and located in rear of, and at the base of, the bridge wall 3, and upright conduits 5 mounted on the main conduit and communicating therewith, the upright conduits being provided with nozzles 6 at their upper ends, each nozzle preferably having its axis alined with the axis of the corresponding upright conduit. The nozzles are formed with slots at their discharge ends arranged parallel to the bridge wall and opening partly in the top of the nozzle and partly in the rear side of the nozzle so that air issuing therefrom is directed upwardly and rearwardly in a sheet. Each nozzle is of the form of a hollow cylindrical body having the cylindrical wall at its upper end

flattened, and thereby forming a straight narrow slot 7 of greater length than the normal diameter of the cylindrical body, the slot being located at the rear of the axis of the cylinder and near the edge of the cylinder, one of the longitudinal sides of the slot being preferably tangent, at its center, designated 8, to the plane of the cylindrical wall of the cylinder so that the slot of the nozzle is located partly in the top and partly in the rear side of the nozzle, and thus the nozzle has opposing walls 9 and 10 thereof diverging toward the ends of the slot and one of the walls thereof between the diverging walls as the portion 11 of the cylindrical wall opposed to the bridge wall, converging toward one side of the slot and also toward the wall 12 of the nozzle at the opposite side of the slot, so that the exit ends of the nozzles flare laterally to spread the air, and are flattened or compressed from front to rear to compress the air in order that it may be ejected in a sheet with accelerated speed.

The upright conduits 5 preferably taper slightly toward their upper ends in order to compress the air before it enters the nozzles and the upper ends of the nozzles preferably terminate short of the horizontal plane of the upper edge of the bridge wall. The slots 7 of all the nozzles are alined and the curvature of the diverging walls 9 and 10 of the nozzles is such that the currents of air passing from the nozzles, meet and form a sheet at substantially the horizontal plane of the top of the bridge wall, as indicated by dotted lines, Fig. 2. Any suitable means as the fan 13 may be provided for forcing the air through the conduits.

A smoke consumer constructed as described, is a unitary structure, can be installed in any type of furnace, at a small expense and without changing the construction of the furnace, and is particularly advantageous in that it forms a sheet of air extending the entire width of the combustion chamber, through which the products of combustion must pass. The current of air, on account of its rearward inclination, also creates a draft in the furnace, which aids greatly in consuming the smoke in the combustion chamber.

What I claim is:—

1. The combination with a furnace; of means for forming and directing a sheet of air into the path of the products of combustion passing from the furnace, said means

comprising a conduit provided with the nozzle in the form of a substantially cylindrical hollow body having a portion of its cylindrical wall at one end compressed toward the opposite portion thereof, so that said compressed portion inclines gradually toward the opposite portion, and also having laterally flared portions contiguous to said compressed portion, the compressed and flared portions forming a narrow slot of greater length than the normal diameter of the cylindrical body, substantially as and for the purpose described.

2. In combination, a furnace having a bridge wall, a combustion-chamber in rear of the bridge wall, and means for injecting a sheet of air into the combustion-chamber comprising a conduit, and a nozzle at the end of the conduit having its axis alined with the axis of the conduit, the nozzle being in the form of a substantially cylindrical body having a portion of its wall at one end compressed toward the opposite portion thereof so that said compressed portion inclines gradually toward the opposite portion, and also having laterally flared portions contiguous to said compressed portion, the compressed and flared portions forming a narrow slot of greater length than the normal diameter of the conduit and cylindrical body, substantially as and for the purpose described.

3. In combination, a furnace having a bridge wall and a combustion-chamber in rear of the bridge wall, and means for injecting a sheet of air into the combustion-chamber comprising a tapering conduit, and a nozzle at the smaller end of the conduit the nozzle being in the form of a substantially cylindrical hollow body having a portion of its wall at one end compressed toward the opposite portion thereof so that said compressed portion inclines gradually toward the opposite portion, and also having laterally flared portions contiguous to said compressed portion, the compressed and flared portions forming a narrow slot of greater length than the normal diameter of the conduit and the cylindrical body, substantially as and for the purpose set forth.

4. The combination with a furnace having a bridge wall, means located in rear of the bridge wall for forming and directing a sheet of air upwardly and rearwardly into the path of the products of combustion, said means comprising a substantially horizontal conduit and upright conduits communicating therewith, each upright conduit being provided at its upper end with a nozzle having its axis alined with the axis of said conduit, each nozzle being of the form of a hollow cylindrical body having the portion of its cylindrical wall opposed to the bridge wall inclined toward the opposite portion of the cylindrical wall of said body and the por-

tions of the cylindrical walls contiguous to said compressed portion flared laterally, the compressed and flared portions forming a narrow slot of greater length than the normal diameter of the conduit and the cylindrical body, substantially as and for the purpose specified.

5. The combination with a furnace, having a bridge wall; of means located in the rear of the bridge wall for forming and directing a sheet of air upwardly and rearwardly into the path of the products of combustion, said means comprising a substantially horizontal conduit extending along the base of the bridge wall, upright conduits mounted on the horizontal conduit and communicating therewith, each upright conduit tapering toward its upper end, and being provided at its upper end with a nozzle of the form of a hollow cylindrical body having the portion of its cylindrical wall opposed to the bridge wall inclined toward the opposite portion of the cylindrical wall of said body, and the portions of the cylindrical wall contiguous to said compressed portion flared laterally, the compressed and flared portions forming a narrow slot of greater length than the normal diameter of the cylindrical body, the slots of all of the upright conduits being in alinement, substantially as and for the purpose specified.

6. In combination, a furnace having a bridge wall and a combustion chamber in rear of the bridge wall, a horizontally extending conduit arranged in rear of, and substantially parallel to, the bridge wall, and having upright conduits communicating therewith, said upright conduits tapering toward their upper ends, and nozzles carried by the upper ends of the upright conduits, each nozzle having the front portion of its wall inclining toward its rear portion and side portions diverging from each other, as said portions approach the upper end of the nozzle, said inclining and diverging portions forming a narrow slot at the upper end of the nozzle of greater length than the diameter of the conduit, substantially as and for the purpose described.

7. In combination, a furnace having a bridge wall and a combustion chamber in rear of the bridge wall, a horizontally extending air conduit arranged in rear of the bridge wall and substantially parallel thereto, and having upright conduits communicating therewith, said upright conduits tapering toward their upper ends, and nozzles carried by the upper ends of the conduits, each nozzle having the front portion of its wall inclining toward its rear portion and side portions thereof diverging from each other, as said portions approach the upper end of the nozzle, said inclining and diverging portions forming a narrow slot at the upper end of the nozzle, the slot being

of greater length than the diameter of the conduit and the slots of all the upright conduits being in alinement, substantially as and for the purpose specified.

5 In testimony whereof, I have hereunto signed my name in the presence of two at-testing witnesses, at Syracuse, in the county

of Onondaga, in the State of New York, this 19th day of December, 1907.

STEPHEN H. NORTH.

Witnesses:

S. DAVIS,

E. K. SEEMILLER.