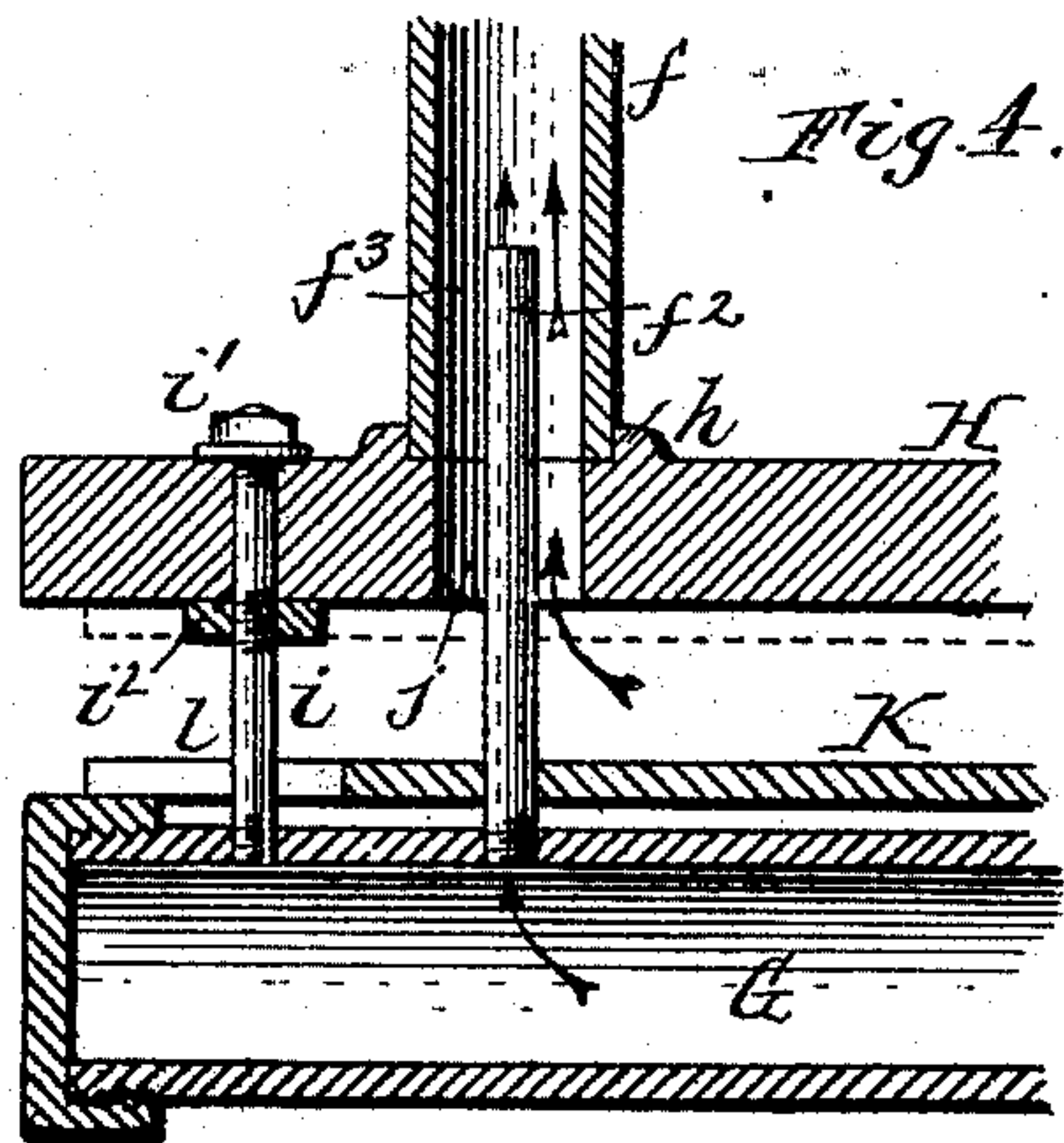
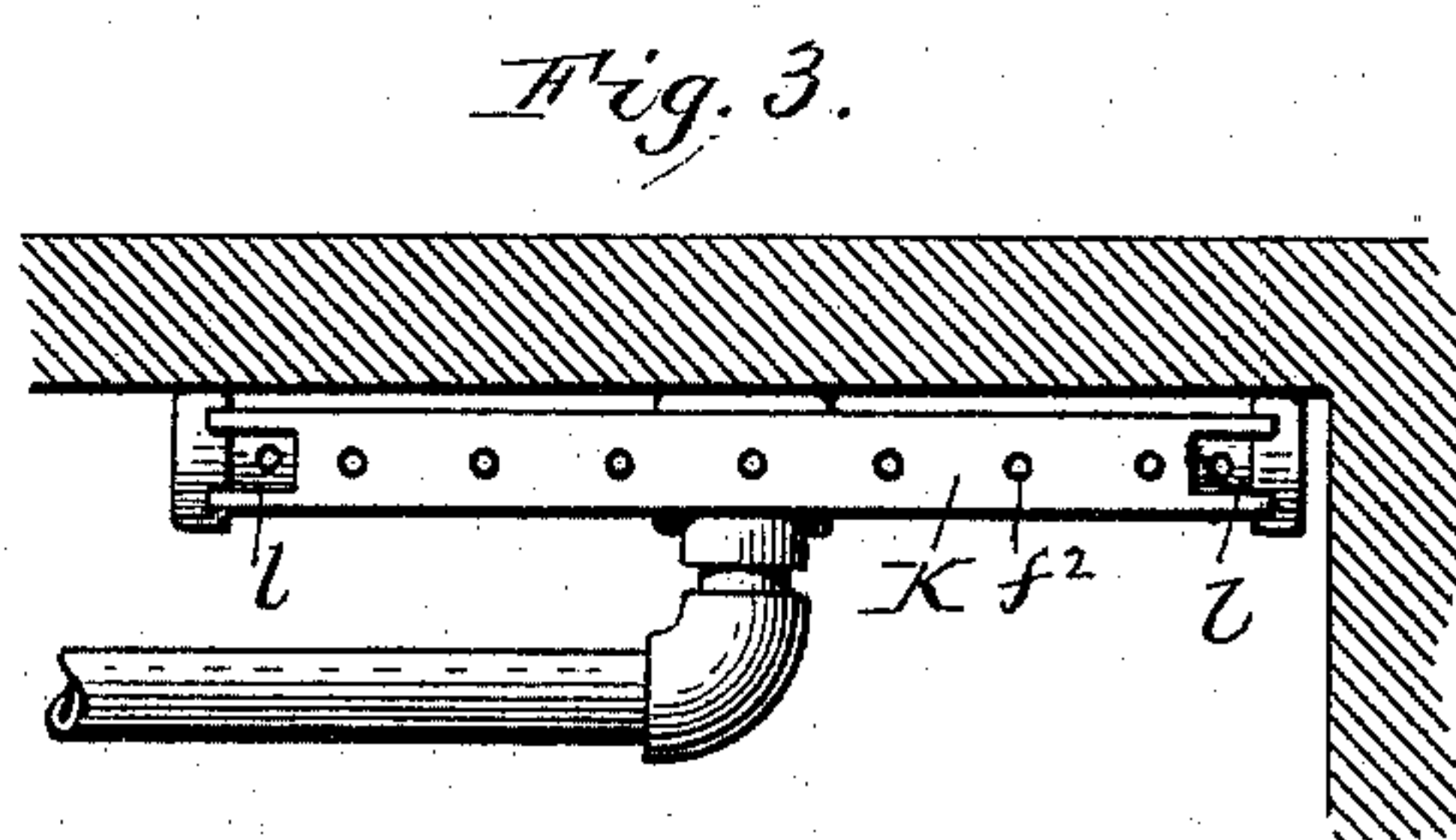
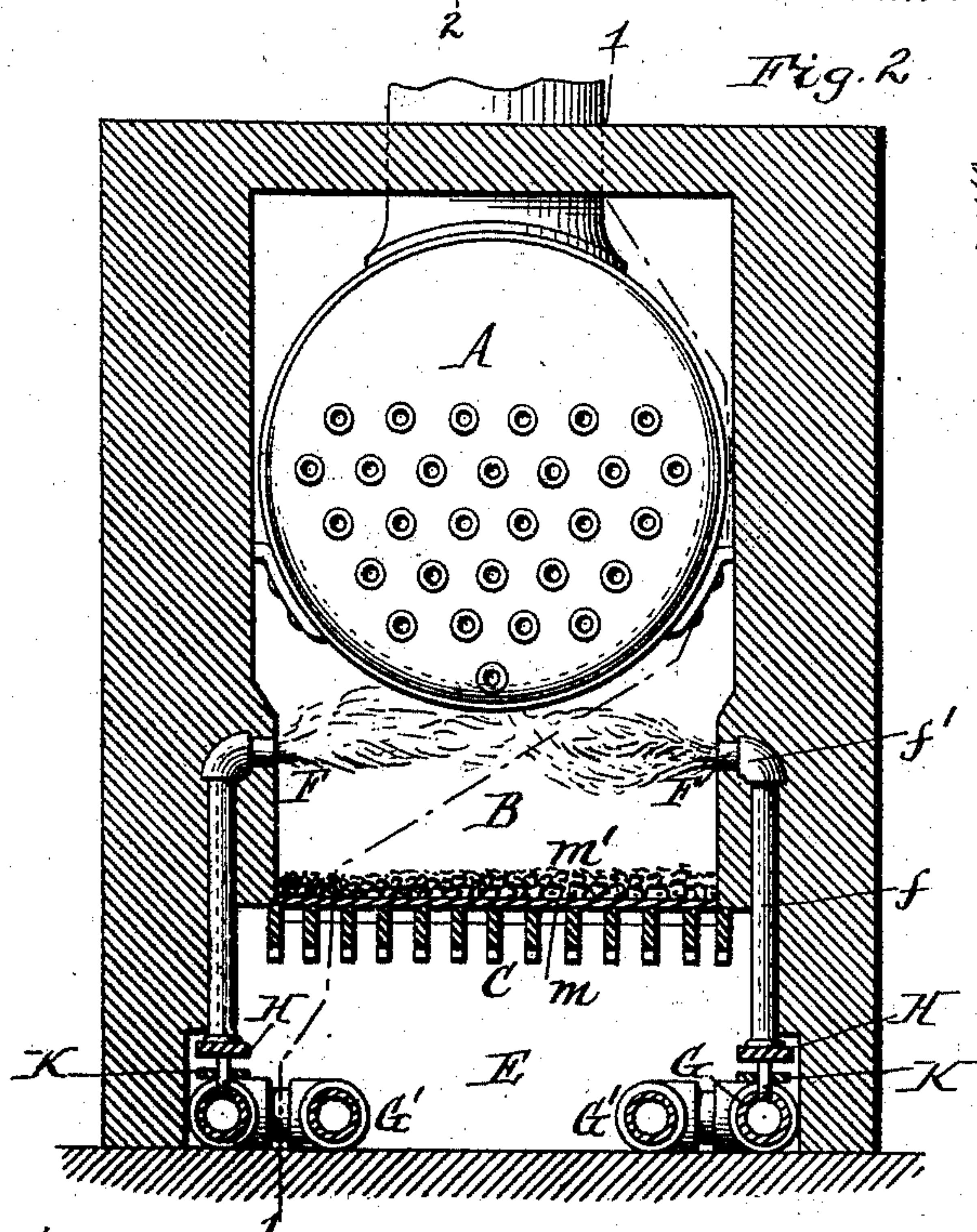
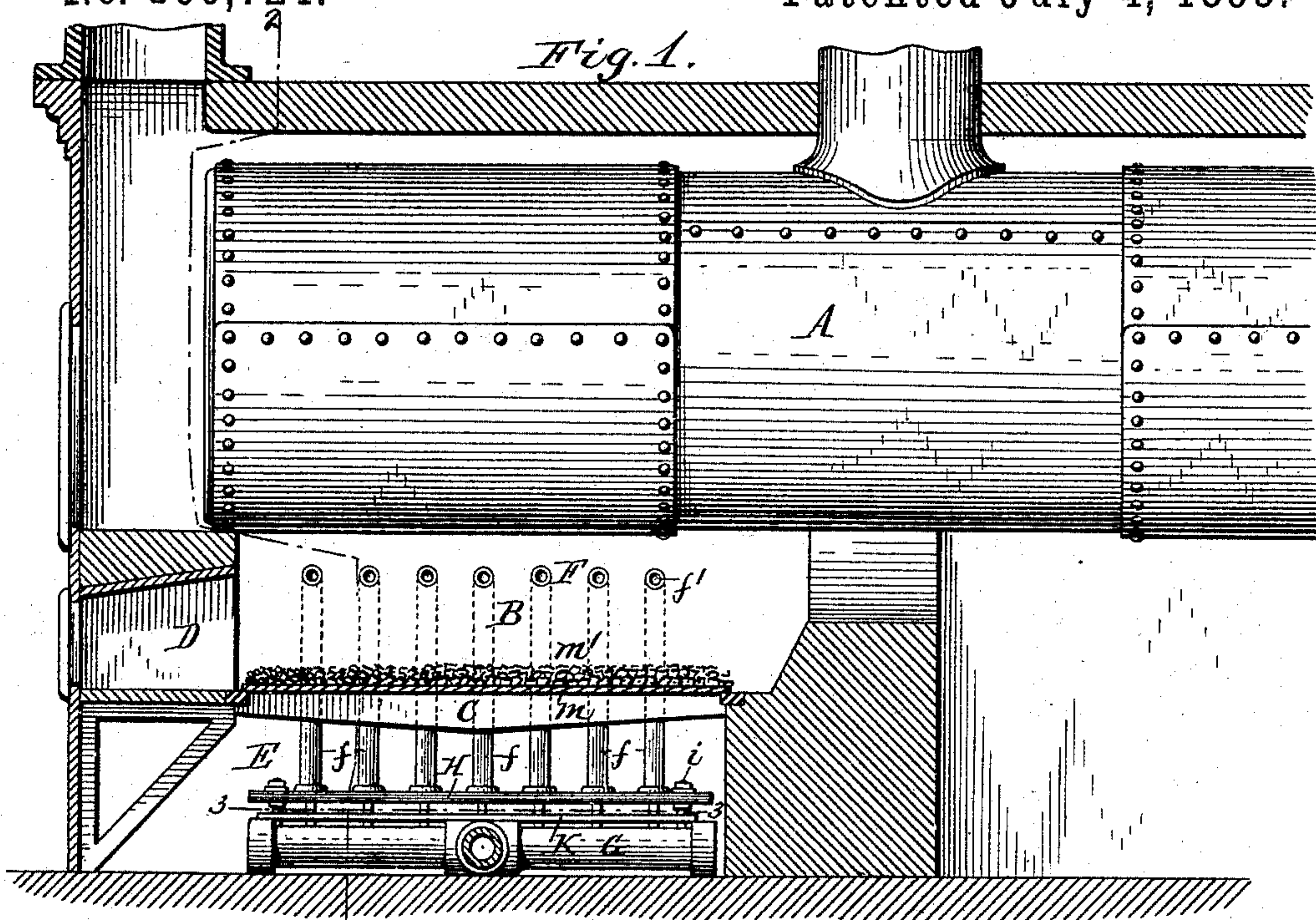


(No Model.)

C. T. SLOAN.
GAS BURNER FOR BOILER FURNACES.

No. 500,724.

Patented July 4, 1893.



Witnesses:

Emil Neuhart.
Chas. F. Barthardt.

Chas. T. Sloan
By Wilhelm H. H. H.

Inventor.
Attorneys.

UNITED STATES PATENT OFFICE.

CHARLES T. SLOAN, OF BUFFALO, NEW YORK.

GAS-BURNER FOR BOILER-FURNACES.

SPECIFICATION forming part of Letters Patent No. 500,724, dated July 4, 1893.

Application filed December 27, 1892. Serial No. 456,390. (No model.)

To all whom it may concern:

Be it known that I, CHARLES T. SLOAN, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Gas-Burners for Boiler-Furnaces, of which the following is a specification.

This invention relates to gas burners designed more particularly for use in connection with steam boiler furnaces for burning either natural or artificial gas, and which are provided with means for mixing air with the gas, to promote combustion. Such burners are usually arranged in groups or gangs on opposite sides of the combustion chamber, and heretofore it has been the practice to provide each burner with a separate or individual air mixer, which renders the same expensive.

The object of my invention is to provide the burners with a simple air mixing device and to construct the same in such a manner that only a single part or manifold is required for a group or plurality of burners, thereby reducing their cost.

In the accompanying drawings:—Figure 1 is a longitudinal section of a steam boiler furnace equipped with my improved burners, the plane of section being in line 1—1, Fig. 2. Fig. 2 is a vertical cross section of the same in line 2—2, Fig. 1. Fig. 3 is a fragmentary horizontal section of the furnace in line 3—3, Fig. 1. Fig. 4 is a fragmentary vertical longitudinal section of one of the burners and connecting parts, on an enlarged scale.

Like letters of reference refer to like parts in the several figures.

A is the steam boiler which is inclosed in masonry in any well known manner.

B is the combustion chamber, C the usual grate bars, D the feed door and E the ash pit.

F represents the gas burners which are preferably arranged in two series or groups on opposite sides of the combustion chamber and open into the latter above the usual level of the coal or similar solid fuel, when such fuel is used instead of gas.

G G represent gas supply manifolds, preferably arranged lengthwise in the ash pit, adjacent to its side walls, and each having a supply pipe G'. Each of the gas burners consists of an upright mixing tube *f*, having an inwardly extending exit branch *f'* opening at

the adjacent inner wall of the combustion chamber, and an upright gas nozzle or pipe *f*² connecting at its lower end with the gas manifold G and projecting a short distance into the open lower end of the mixing tube *f*. This nozzle-pipe is open at its upper end to admit the gas into the mixing tube and is separated from the inner wall of the tube by an annular air space or passage *f*³. The upper portions of the mixing tubes and their exit branches *f'* are preferably embedded in the masonry of the furnace, as shown.

H H are horizontal supporting plates or air supply manifolds arranged in the ash pit, underneath the two groups of burners, respectively, and upon which the mixing tubes of the burners rest, said plates being formed on their upper sides with raised annular rims or sockets *h*, in which the lower ends of the tubes are seated and confined against displacement. These plates are preferably supported from the gas manifolds G by upright rods or pipes *i* secured at their lower screw-threaded ends in threaded openings formed in the upper side of said manifolds, as shown in Fig. 4. Each of these supporting rods or pipes passes with its upper portion through an opening in the supporting plate and is provided above and below the plate with nuts *i'* *i*² between which the plate is clamped. These plates are raised above the gas manifolds G as shown, to admit air underneath the same, and each plate is provided with vertical air apertures or passages *j* which register with the lower ends of the mixing tubes respectively, and which extend through the plate and are larger than the gas nozzles *f*², to permit air to rise between the latter and the walls of the apertures.

K is a horizontally movable damper or valve plate arranged underneath each air manifold H and adapted to be raised against the under side thereof, as shown by dotted lines in Fig. 4, for closing its air passages *j* when it is desired to burn coal or other solid fuel, instead of gas. The damper is supported in this raised position by placing removable blocks under it, or by any other suitable means. In its open or depressed position, the damper preferably rests loosely upon the gas manifold G and is confined in place and guided in its movements by the supporting rods *i* which pass through openings in the damper. The ends of the

damper are recessed, as shown at *l*, in Figs. 3 and 4, to clear the lower nuts of the said supporting rods, when raised against the air manifold H.

- 5 When gas is burned in the furnace, the grate bars are preferably covered by a sheet metal plate *m* upon which is placed a layer *m'* of ashes or other refractory material. Upon admitting gas to the manifolds G, the gas
 10 passes into the mixing tubes of the several burners through the nozzles *f*², and at the same time a certain volume of air is drawn into the lower ends of the mixing tubes through the air apertures in the air manifolds or sup-
 15 porting plates H, thereby insuring a complete combustion. The supply of air may be increased or diminished by varying the distance between the dampers or valve plates and the under side of said air manifolds.
 20 My improved air mixing device is extremely simple in construction, as it involves but a single perforated plate which is cast in one piece at small cost. It also avoids the neces-
 25 sity of employing a separate mixer for each burner and saves the time and labor incident

to applying the usual individual mixers to the burners, and it furthermore furnishes a firm support for the burners, especially when they are not incased in the masonry of the furnace.

I claim as my invention—

The combination with a gas supply manifold, of a supporting plate or air supply manifold arranged above said gas manifold and having air apertures, a number of burners having mixing tubes resting upon said air manifold and registering respectively with the air apertures of the latter, gas nozzles extending upwardly from said gas manifolds through said apertures and into said mixing tubes, and a damper or valve plate supported in its open position upon said gas manifold and adapted to close against the underside of said air manifold, substantially as set forth.

Witness my hand this 22d day of December, 1892.

CHARLES T. SLOAN.

Witnesses:

CARL F. GEYER,
 FRED. C. GEYER.