

S. C. Sturtevant,

Furnace Grate.

Patented June 11, 1861.

N^o 32,541

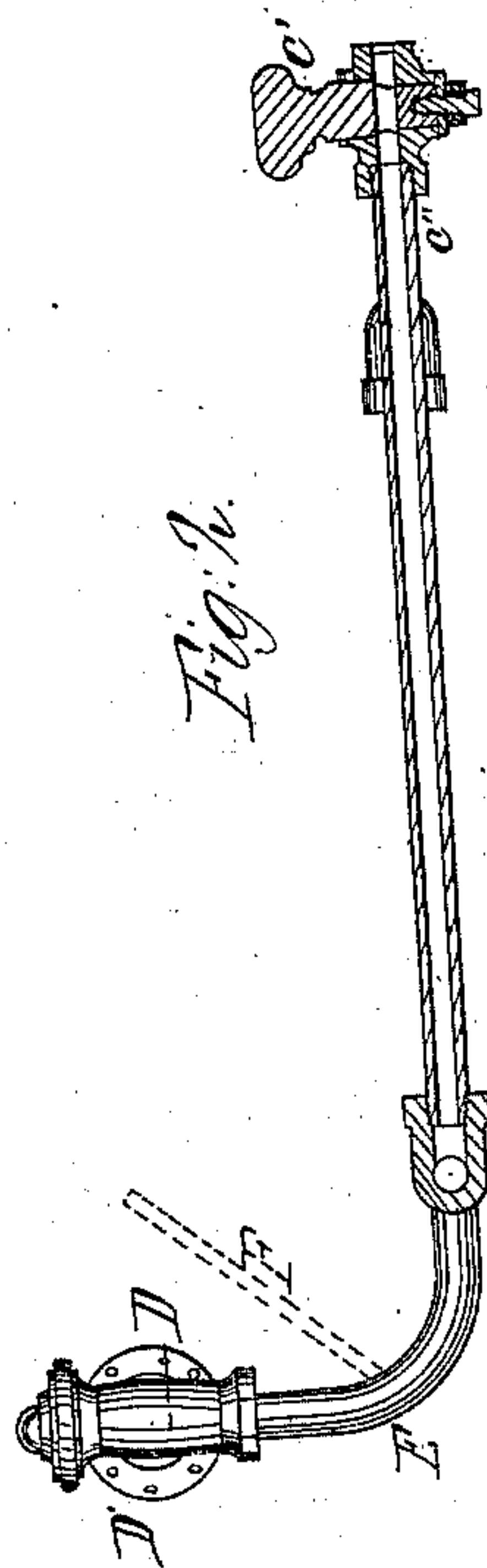


Fig. 2.

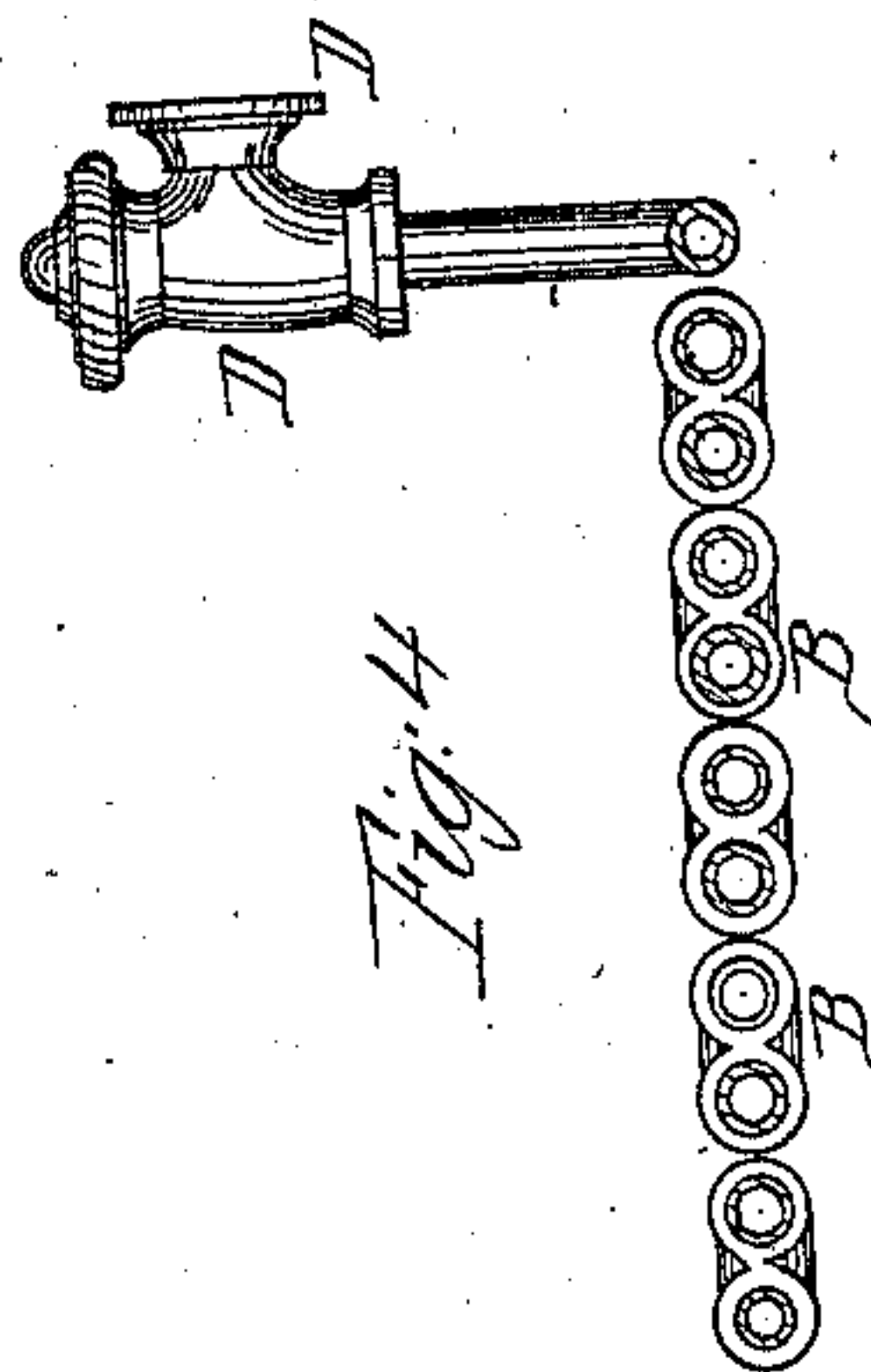


Fig. 4.

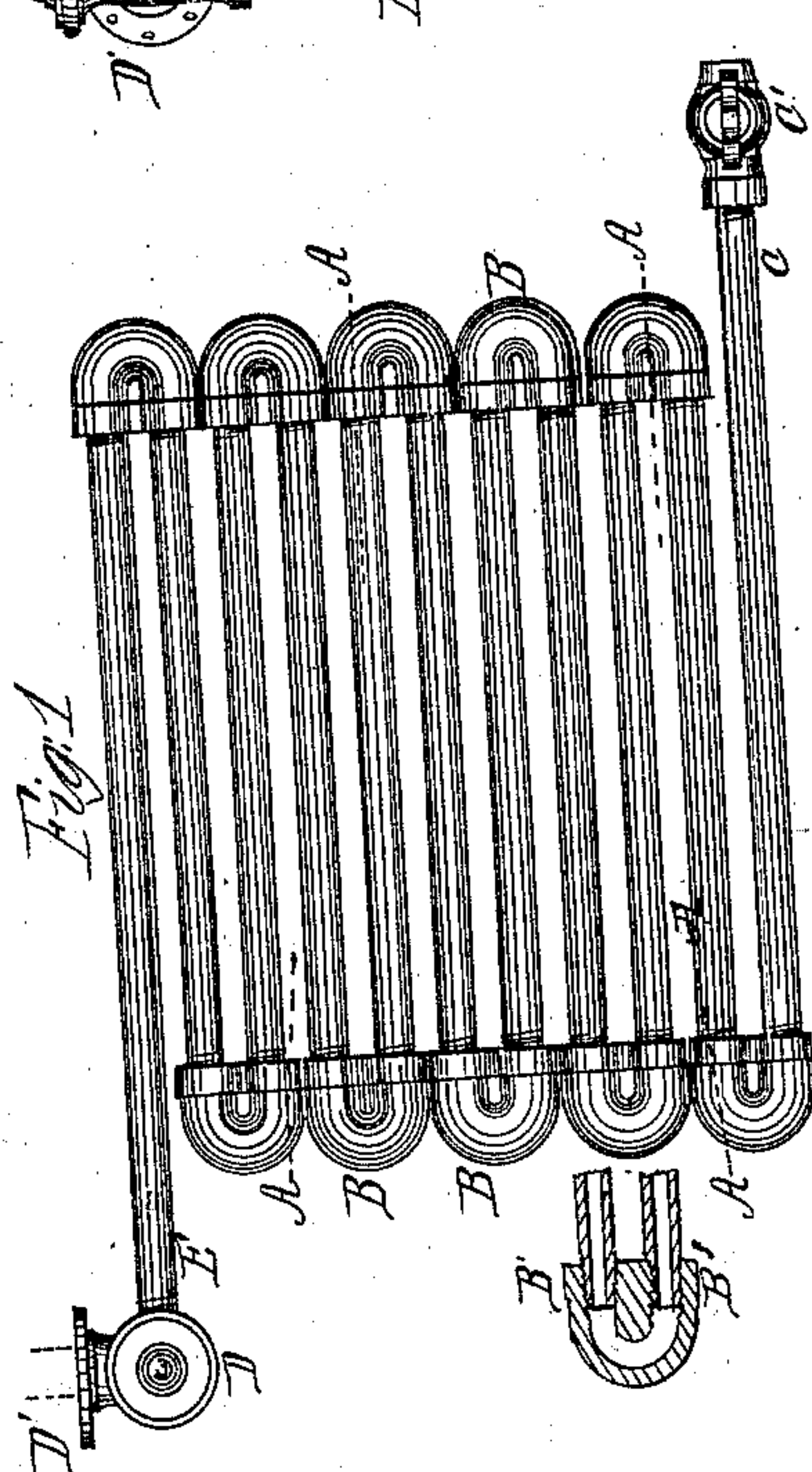


Fig. 1.

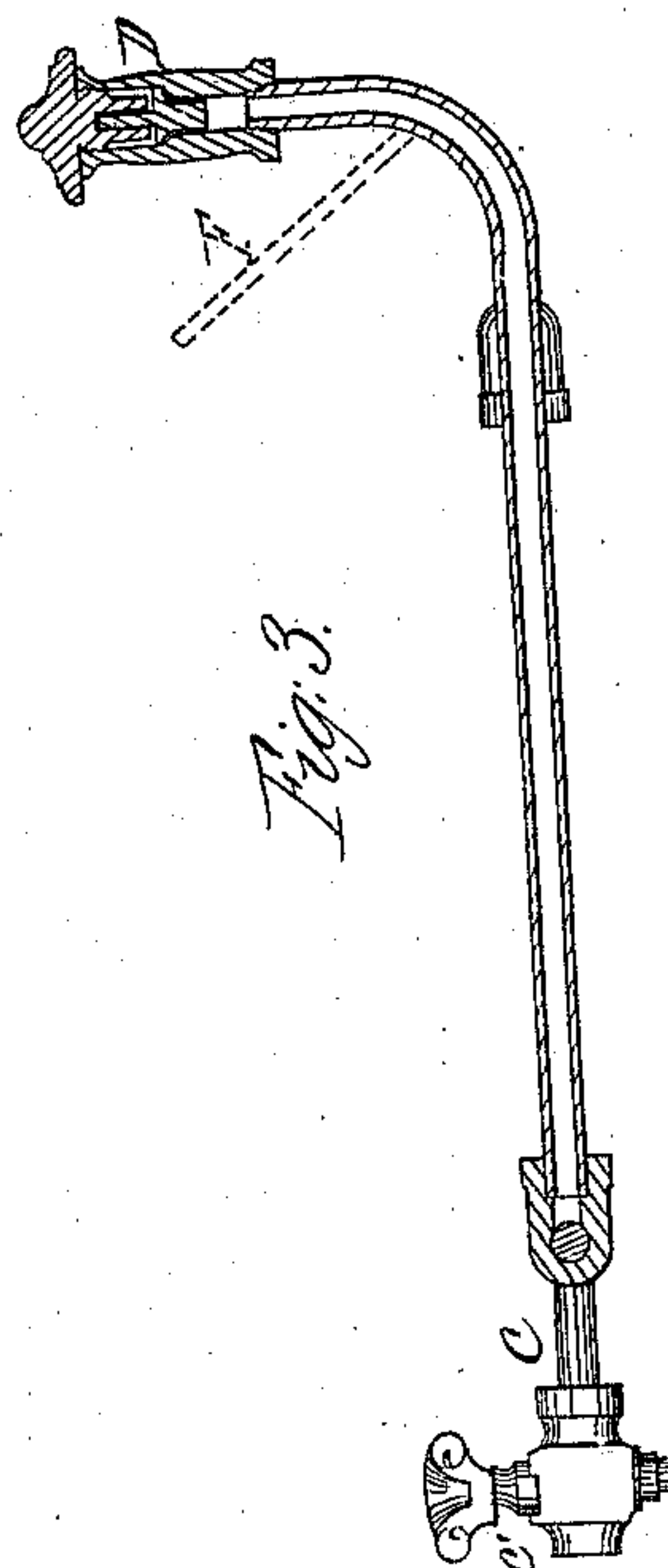


Fig. 3.

Witnesses:

*W. H. Burdage
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Inventor:

S. C. Sturtevant

UNITED STATES PATENT OFFICE.

S. C. STURTEVANT, OF CLEVELAND, OHIO.

TUBULAR GRATE FOR STEAM-BOILERS.

Specification of Letters Patent No. 32,541, dated June 11, 1861.

To all whom it may concern:

Be it known that I, S. C. STURTEVANT, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented new and useful
5 Improvements in Combined Heater Flue-Grates; and I do hereby declare that the following is a full and complete description of the construction and operation of the same, reference being had to the accompanying
10 drawings, making part of this specification, in which—

Figure 1 is a top view, Figs. 2 and 3 are longitudinal sections, and Fig. 4 is a transverse section.

15 Like letters refer to like parts.

The nature of this invention relates to a combined heater flue grate, so constructed that it can be readily attached to and detached from the boiler, and through which
20 water is supplied to the boiler in a heated condition by means of a force pump. Its structure is also such that the pipes of which it is composed can be separated from each other for the purpose of cleaning or repairs.

25 A A A represents wrought iron pipes or tubes, having a diameter of from two to three inches, according to the size of the boiler where they are to be used, and of suitable length to span the brick work or fire
30 bed where they are used. Upon one end of each tube is cut a right hand screw, and upon the other end is cut a left hand screw. The return end pieces B have corresponding right and left hand threads cut in their
35 open ends, into which the tubes A are screwed, as shown in section B' Fig. 1. The whole series when put together is shown in Fig. 1.

40 The tube C, being the first in the series, connects with the force pump, and thereby with the tank containing the supply water.

C' represents a gage cock, which can be opened or closed at pleasure, to regulate the quantity of water passed through the tubes
45 to supply the boiler.

D is a check valve forming a connection

between the pipe E and boiler, the functions thereof being the same as in the ordinary check valve, to prevent the return of water from the boiler. The whole series of flue
50 grates is connected with the boiler in the way that pipes are usually connected—that is, by a seat, gasket and screw bolts, passing through the flange D'. I also connect the
55 tube E with the boiler by a small pipe indicated by the red line F, for the purpose of establishing a connection between the boiler and the tubes A, when the engine is not at work, thus preserving an equilibrium be-
60 tween the temperature of the water in the boiler and tubes. The pipe F should not be more than one fourth the diameter of the
65 flues and the point of connection with the boiler not more than one tenth the area of the tubes, so that the pressure of the water
70 in the boiler shall not obstruct the action of the pump when the engine is at work, but which is at the same time sufficient to conduct off into the boiler any steam that may
75 be generated in the flues while the engine is not at work. The water, inflowing through these tubular grates, becomes heated, so that it enters the boiler without reducing the
80 temperature of the water therein.

Some of the advantages of this grate over
75 others made in the usual form are, 1st, that it costs less than the ordinary cast iron grate by at least twenty per cent.; 2nd, it will last
80 five times longer than the cast grate; 3rd, it supplies the place and performs the office of a heater for the water, and 4th, it is portable, being easily attached to and detached from the boiler.

What I claim as my improvement and desire to secure by Letters Patent, is—

85 A series of detachable flue grates, when used in combination with the pipe F, as and for the purpose specified.

S. C. STURTEVANT.

Witnesses:

W. H. BURRIDGE,
HENRY VOTH.