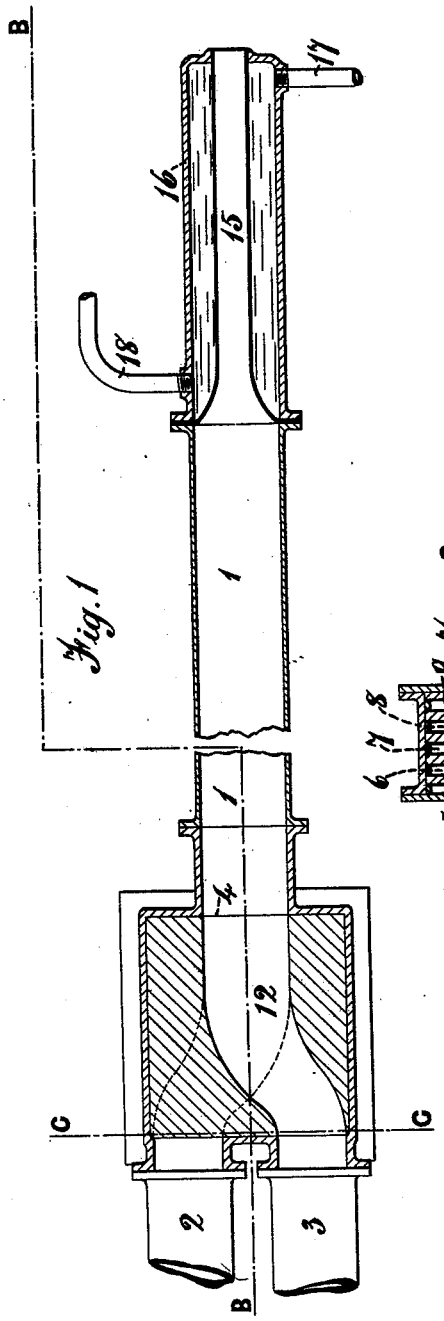
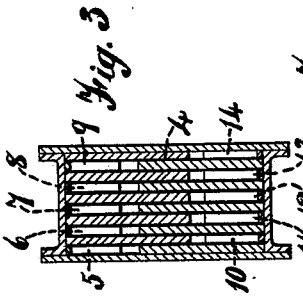
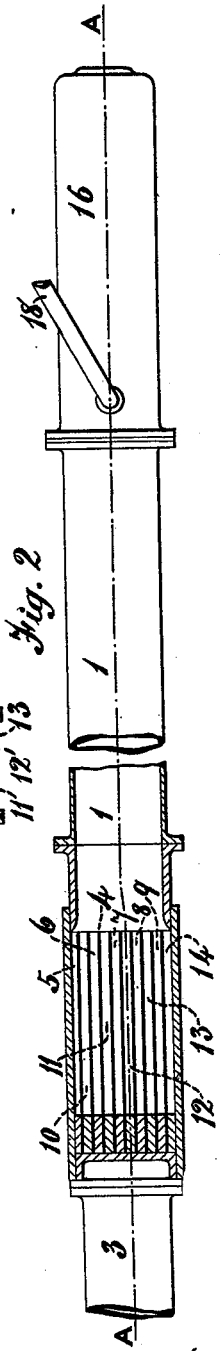
W. S. SUTHERLAND.

Apparatus for Preparing Gaseous Fuel.

**No. 206,642.** **Patented July 30, 1878.**




*Witnesses*

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# UNITED STATES PATENT OFFICE.

WILLIAM S. SUTHERLAND, OF COOMB'S WOOD, HALESOWEN, ENGLAND.

## IMPROVEMENT IN APPARATUS FOR PREPARING GASEOUS FUEL.

Specification forming part of Letters Patent No. **206,642**, dated July 30, 1878; application filed March 12, 1877; patented in England, May 20, 1874.

*To all whom it may concern:*

Be it known that I, WILLIAM SEDDON SUTHERLAND, of Coomb's Wood, Halesowen, in the county of Worcester, England, engineer, have invented a new and useful improvement in apparatus or appliances to be used in obtaining heat by the combustion of gaseous fuel and atmospheric air, for which English patent No. 1,784, May 20, 1874, was granted, of which the following is a specification:

This invention relates to apparatus or appliances to be used in obtaining heat by the combustion of gaseous fuel, such as carbonic-oxide gas and air, in the manner described in a specification for Letters Patent of the United States for which I have applied simultaneously with this.

The invention consists, first, in so constructing or forming a mixing-chamber that the gaseous fuel and atmospheric air enter the said chamber in alternate thin parallel or converging layers or streams, so as to offer large diffusing and mixing surfaces. Diaphragms, plates, or tubes are employed as means for causing the said gaseous fuel and air to enter the chamber, as above mentioned.

In the accompanying sheet of drawings, Figure 1 is a section through the line A A, Fig. 2 a section through the line B B, and Fig. 3 a section through the line C C, of apparatus constructed under my invention.

1 is the mixing-chamber. 2 is the atmospheric-air supply-pipe. 3 is the gaseous-fuel supply-pipe. 4 are plates or diaphragms placed parallel to each other, with the spaces 5 6 7 8 9 opening to the atmospheric-air supply and the spaces 10 11 12 13 14 opening to the gaseous-fuel supply. The air and gaseous fuel are caused to travel through the pipes 2 3, through the spaces 5 6 7 8 9 10 11 12 13 14, and issue in alternate layers into the mixing-chamber 1, where they diffuse and mix together, and whence they pass by the pipe 15 to the furnace or combustion-chamber.

The invention consists, secondly, in surrounding the pipe which leads from the mixing-chamber to the furnace or combustion-chamber with a jacket covering, between which and the said pipe cooling-fluid is caused to circulate.

In the accompanying drawings, 16 is the jacket or covering surrounding the pipe 15, which leads from the mixing-chamber 1 to the furnace or combustion-chamber; 17, inlet-pipe for water; 18, outlet-pipe for water.

The above arrangement assists in keeping the mixed gases cool, so as to prevent the flame from traveling backward to the mixing-chamber.

Having now described the nature of my invention, I claim—

1. The combination, with the mixing-chamber, of the air and gas supply pipes and a series of plates or parallel diaphragms having spaces opening to the air and gas supply pipes, so that the gas and air issue in alternate layers, substantially as and for the purpose specified.

2. The combination, with the mixing-chamber and the parallel plates for mixing the air and gas, of the pipe leading to the combustion-chamber and the water-jacket or covering surrounding the combustion-pipe, substantially as and for the purpose specified.

WILLIAM SEDDON SUTHERLAND.

Witnesses:

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