

No. 872,833.

PATENTED DEC. 3, 1907.

O. MANNESMANN.  
INVERTED GAS BURNER.  
APPLICATION FILED DEC. 12, 1906.

FIG. 1.

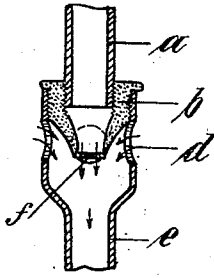


FIG. 2.

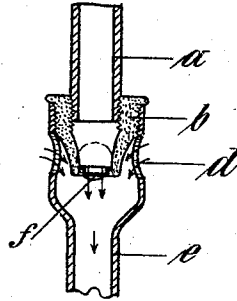


FIG. 3.

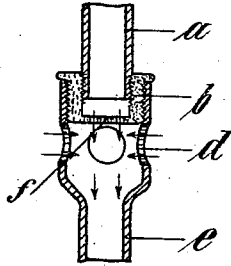


FIG. 4.

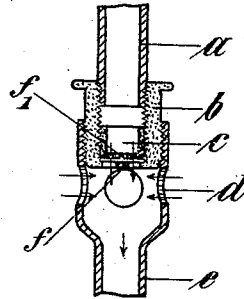


FIG. 5.

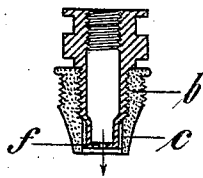
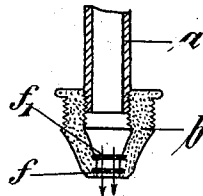


FIG. 6.



Witness:  
Ludwig Winter  
Printer

Inventor  
Otto Mannesmann  
by Ferdinand Muehl  
Attorney

# UNITED STATES PATENT OFFICE.

OTTO MANNESMANN, OF REMSCHEID, GERMANY.

## INVERTED GAS-BURNER.

No. 872,833.

Specification of Letters Patent.

Patented Dec. 3, 1907.

Application filed December 12, 1906. Serial No. 347,550.

*To all whom it may concern:*

Be it known that I, OTTO MANNESMANN, a citizen of the German Empire, and resident of Remscheid, Germany, have invented certain new and useful Improvements in Inverted Gas-Burners, of which the following is a specification.

This invention relates to inverted gas burners for incandescent light the construction of which is improved in such a manner that the air to be admixed with the gas is previously heated and that the nozzle is made from soap-stone, porcelain or other suitable material which is a bad conductor of heat. The invention further relates to other improvements in the burner which together with the improvements hereinbefore mentioned create an inverted gas burner of the most perfect type.

For upright incandescent gas burners nozzles from soap-stone have been used for some time but they have then been abandoned because they did not offer any advantage over the metal nozzles, which were quite satisfactory and further permitted to regulate the gasholes according to requirement by widening them with a needle or by narrowing them through hammering the nozzle accordingly. With inverted gas burners nozzles from material which is a bad conductor of heat have up to the present not been used because the metal nozzles were quite sufficient with burners in which the gases of combustion are taken off at some distance below the burner after they have been conducted laterally away from the burner wherefrom results that the nozzle is kept cool. If however the air for combustion has to be intensively heated before being admixed with the gas, the nozzle will be strongly heated and deposits from the gas will be formed at the gas holes which soon will obstruct the holes and interrupt the proper working of the burner.

The object of the present invention is, to previously heat the air for combustion, for which purpose the nozzle is made from soap-stone or other material which is a bad conductor of heat and is constructed otherwise in such a manner that a very steady light is obtained.

In the accompanying drawings the improved inverted gas-burner is shown in various forms of execution.

Figures 1 to 6 represent the improved gas

burner in vertical section and in various forms.

According to Fig. 1 the nozzle *b* which is fixed in any suitable manner at the end of the gas pipe *a* is made of porcelain or other suitable material which is a bad conductor of heat which is provided with holes *f* for the passage of the gas from pipe *a* into the mixing chamber *e* which is provided with the inlets *d* for the air for combustion. This burner possesses the advantage that in consequence of the very favorable proportion between the heat conducted by the nozzle and the radiation of heat caused through the inflow of the cold gas much less deposits are formed than would be the case with metal nozzles. In fact there will scarcely be any deposits at all. A further advantage of the burner represented in Fig. 1 is, that the end of the nozzle which is provided with the gas holes will not be deformed when the burner is put in place or cleaned whereby the direction of the gas jets is kept constant with regard to the mixing tube, which is of the greatest importance with inverted gas burners when a soot-less flame is to be obtained.

As shown in Fig. 2 the bottom of the porcelain nozzle *b* is of metal which construction allows to obtain the advantage that the nozzle remains cool, while on the other hand the second of the hereinbefore mentioned advantages is lost, that namely a deformation of the bottom part is prevented.

According to Fig. 3 the bottom of the nozzle *b* is flat and horizontal wherefrom results that the air for combustion does not come in contact with the side walls of the nozzle but flows along the gas holes *f*; the keeping cool of the nozzle is thus facilitated very much.

According to Fig. 4 the nozzle *b* is furnished with an inner nozzle *c*, the bottom of which has gas holes *f*<sup>1</sup> which are much smaller than the gas holes *f* of the bottom of the outer nozzle *b*. The two nozzles are arranged in such a manner that the bottom of the inner nozzle is not in contact with but very close to the bottom of the outer nozzle and that the gas holes *f*<sup>1</sup> are exactly over the gas holes *f*. This construction offers the advantage that with back lighting only the gas flowing out of holes *f* will burn while the flame does not touch the fine gas holes *f*<sup>1</sup>. The gas flows in thin jets out of the gas holes

$f^1$  and passes then freely through the larger holes  $f$  to admix with the air for combustion.

According to the modified construction shown in Fig. 5, the outer nozzle  $b$  is open at the bottom and forms a protecting flange for the bottom plate of the inner nozzle  $c$ .

According to Fig. 6 the porcelain nozzle  $b$  has two superposed metal bottom plates  $f, f^1$ , which are some distance apart from one another.

The leading idea of my invention is, to effectively protect from heat the bottom part of the nozzle of inverted incandescent gas burners which is obtained by making this bottom part as well as the nozzle from a material which is a bad conductor of heat or by surrounding the separate bottom plate which may be of any suitable material by an envelop of material which is a bad conductor of heat.

Having now described my invention what

I claim and desire to have protected by Letters Patent is:—

An improved nozzle for inverted incandescent gas burners with previously heated air for combustion having a nozzle from material which is a bad conductor of heat in combination with a bottom plate of suitable material with large perforations and a second plate of suitable material arranged inside the nozzle above said first bottom plate and having perforations of smaller diameter than those of the first bottom plate, substantially as described and shown and for the purpose set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

OTTO MANNESMANN. [L. s.]

Witnesses:

OTTO KÖNIG,  
J. A. RITTERSHAUS.