

E. R. BRAYSHAW.
GAS BURNER.

APPLICATION FILED MAR. 17, 1911.

1,024,393.

Patented Apr. 23, 1912.

5 SHEETS—SHEET 1.

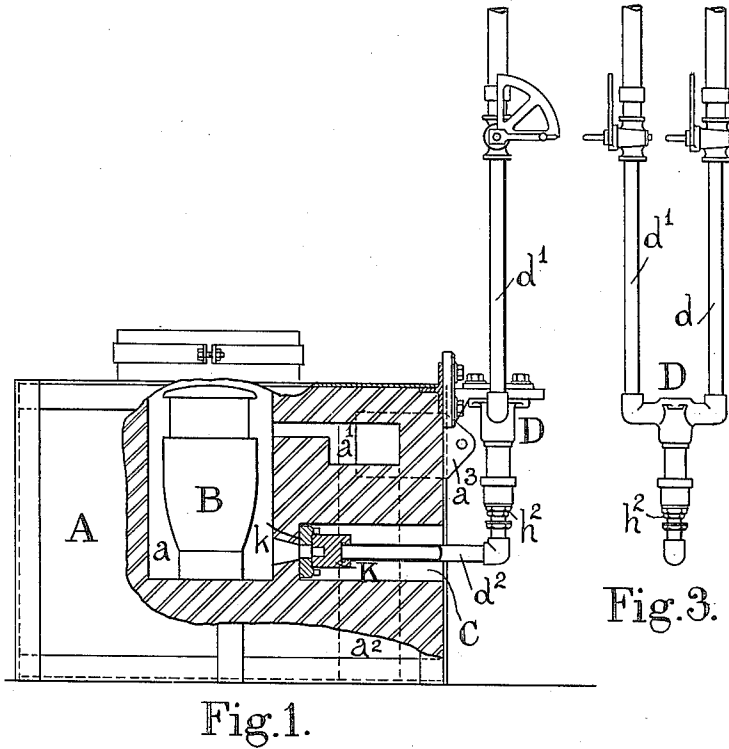
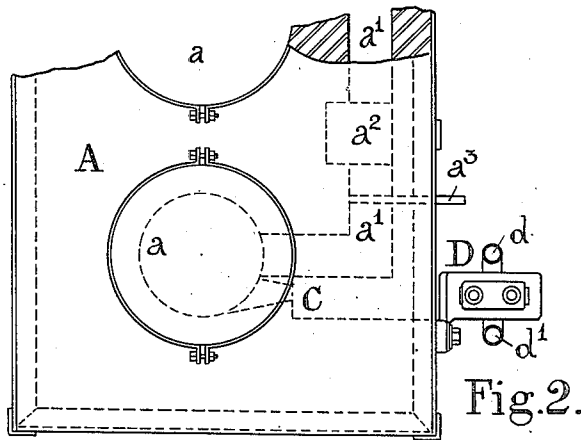


Fig. 3.



WITNESSES

W. B. Kessler
C. H. Kessler

INVENTOR

Edmund R. Brayshaw
by *James L. Perrio*

E. R. BRAYSHAW.

GAS BURNER.

APPLICATION FILED MAR. 17, 1911.

1,024,393.

Patented Apr. 23, 1912.

5 SHEETS—SHEET 2.

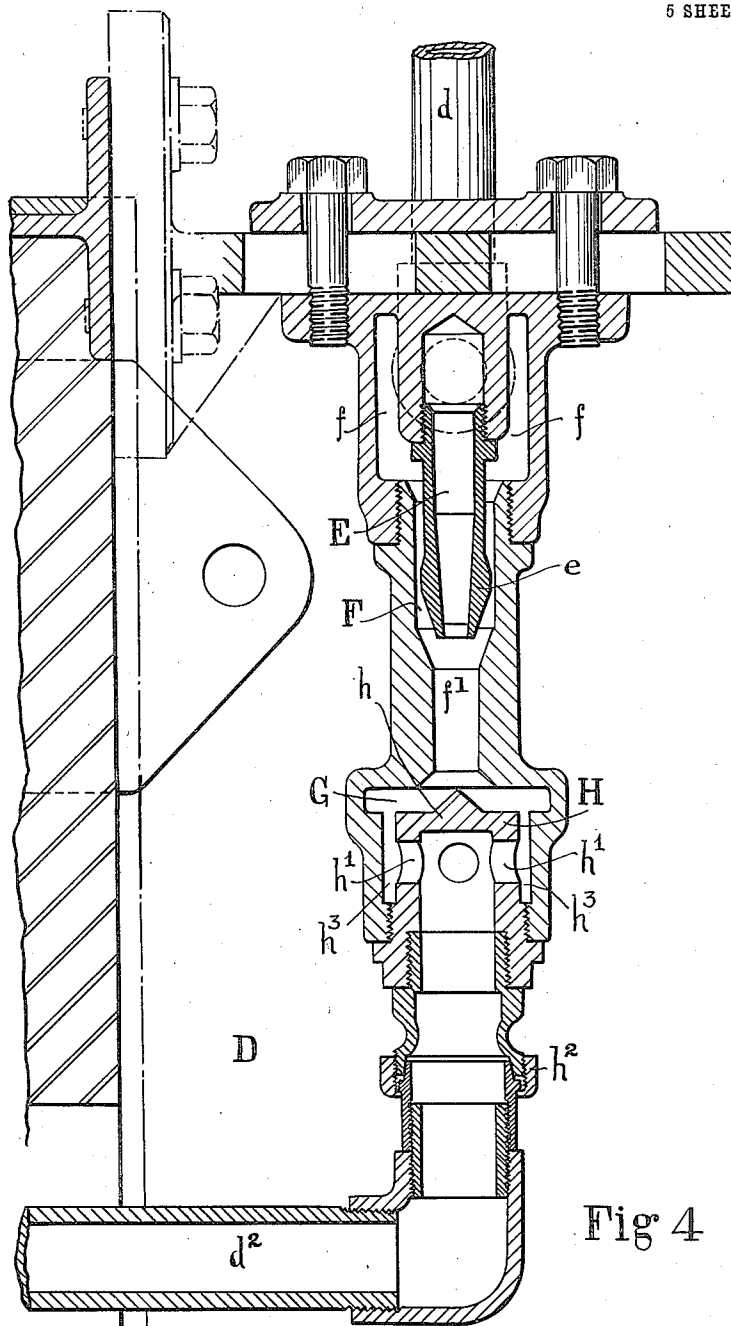


Fig 4

WITNESSES

Edmund R. Brayshaw
James L. Morris

INVENTOR

Edmund R. Brayshaw
by *James L. Morris*

E. R. BRAYSHAW.
GAS BURNER.
APPLICATION FILED MAR. 17, 1911.

1,024,393.

Patented Apr. 23, 1912.

5 SHEETS—SHEET 3.

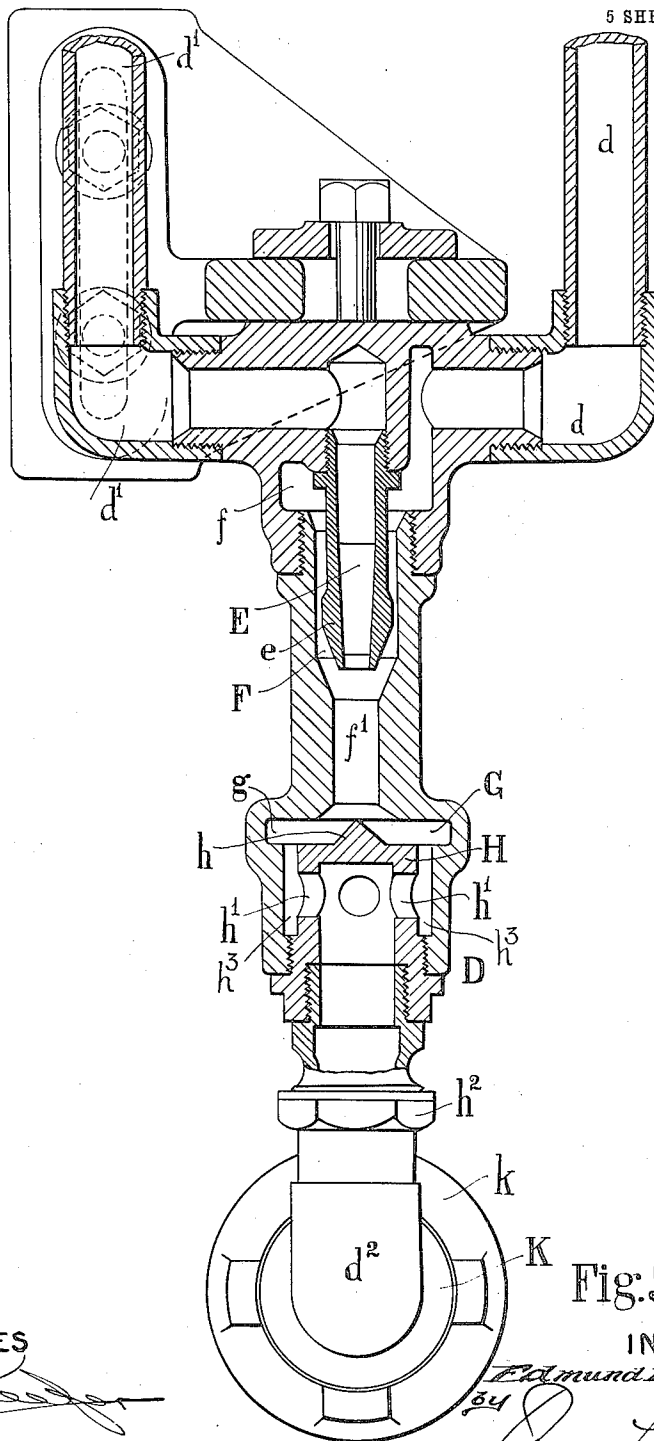


Fig. 5.

WITNESSES

J. B. [Signature]
E. [Signature]

INVENTOR

Edmund R. Brayshaw
54
Amos A. [Signature]
Atty.

E. R. BRAYSHAW.
GAS BURNER.
APPLICATION FILED MAR. 17, 1911.

1,024,393.

Patented Apr. 23, 1912.

5 SHEETS—SHEET 4.

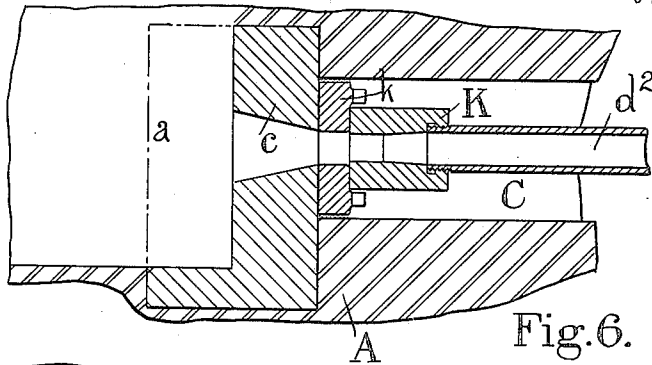


Fig. 6.

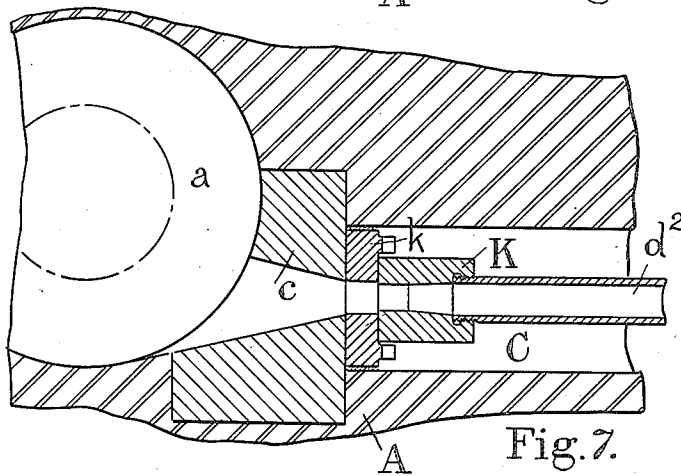


Fig. 7.

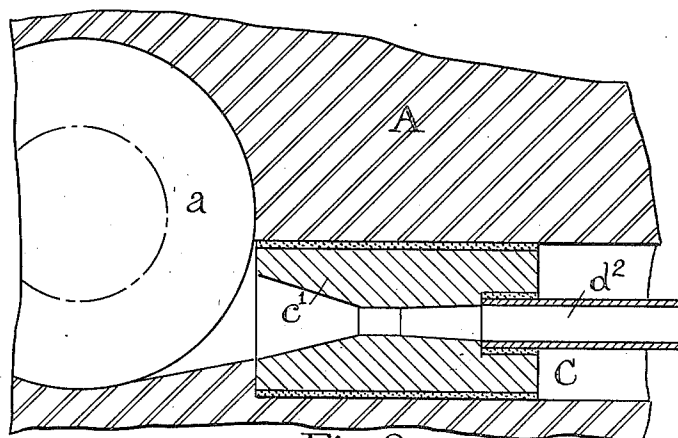


Fig. 8.

WITNESSES

W. B. Shaw
W. B. Shaw

INVENTOR

Edmund B. Bragshaw
BY *Samuel J. Norris*

E. R. BRAYSHAW.
GAS BURNER.
APPLICATION FILED MAR. 17, 1911.

1,024,393.

Patented Apr. 23, 1912.

5 SHEETS—SHEET 5.

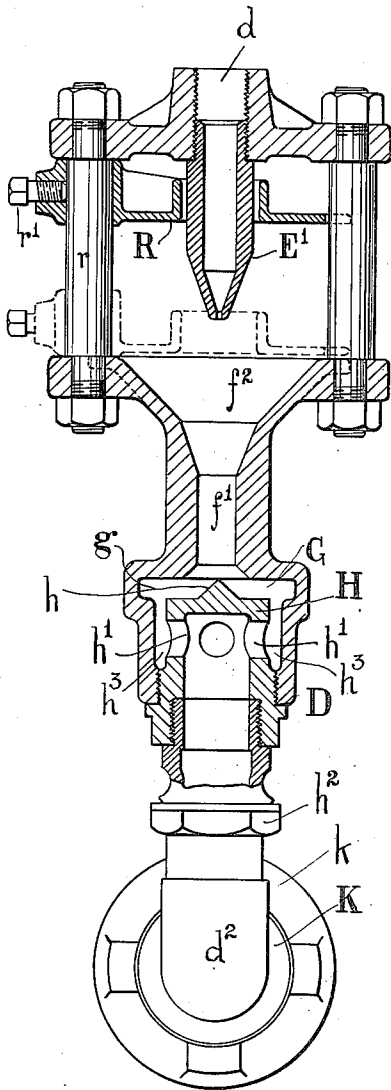


Fig. 9.

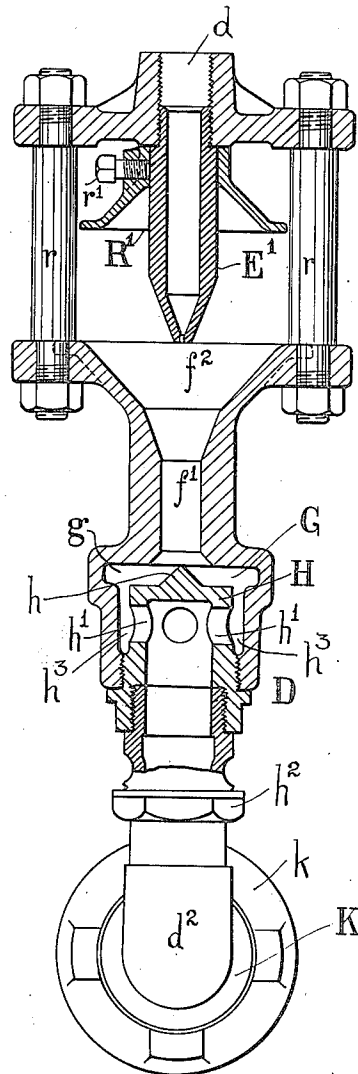


Fig. 10.

WITNESSES

W. B. Kester
W. B. Kester

INVENTOR

Edmund R. Brayshaw
by *Samuel L. Morris, Jr.*

UNITED STATES PATENT OFFICE.

EDMUND RUSSELL BRAYSHAW, OF MANCHESTER, ENGLAND.

GAS-BURNER.

1,024,393.

Specification of Letters Patent.

Patented Apr. 23, 1912.

Application filed March 17, 1911. Serial No. 615,075.

To all whom it may concern.

Be it known that I, EDMUND RUSSELL BRAYSHAW, a British subject, residing at Hulme, Manchester, county of Lancaster, England, have invented certain new and useful Improvements in Gas-Burners, of which the following is a specification.

This invention relates to gas burners for heating furnaces such as are employed for melting metals in crucibles and is designed to provide an improved arrangement and construction of burner in which the gas or air will be thoroughly mixed to enable a given quantity of gas to produce a higher temperature or a given temperature to be obtained with less gas and with compressed air at a lower pressure.

The invention will be fully described with reference to the accompanying drawings forming part of the specification.

Figure 1, is a side elevation of the furnace, showing the burner applied thereto. Fig. 2, is a part plan of the furnace (which is built in pairs) showing the burner applied thereto. Fig. 3, is a front elevation of the burner. Fig. 4, is an enlarged sectional elevation of the burner and a part of the furnace. Fig. 5, is a sectional elevation of the burner from the front. Fig. 6, is a sectional elevation through the heating inlet of the furnace showing the protecting block on the end of the burner tube. Fig. 7, is a sectional plan of the same. Fig. 8, is a sectional plan through the heating inlet of the furnace showing a modification with the protecting block surrounding the end of the burner tube. Fig. 9 is a vertical sectional view showing a slightly modified construction of mixing burner. Fig. 10 is a similar view showing a further modified construction of the same.

The furnace A is constructed in the usual way of refractory material with a chamber *a* to receive a crucible B and a heating inlet C at the side through which the outlet tube *d*² of the burner D enters.

The furnace is built in pairs, with a horizontal flue *a'* leading from near the front of each to the vertical flue *a*², each of the flues *a'* being provided with a separate damper *a*³ so that one may be shut off or regulated independently of the other.

The burner D is constructed with a gas inlet pipe *d* and air inlet pipe *d'* and an outlet or delivery pipe *d*² which enters the furnace. The air pipe *d'* (see Figs. 4 and

5) is connected to a nozzle E in the interior of the burner which is conical internally and of less capacity than the air pipe *d'* so that the air is caused to issue therefrom in a jet at an increased velocity. The exterior of the nozzle is enlarged at *e* and tapers to the outlet. The nozzle E is fitted in a gas chamber F with which the gas pipe *d* connects, the gas chamber being enlarged at *f* to receive the full volume of gas and contracted around the nozzle E and then tapering beyond the end of the nozzle to a narrower passage *f'*. The air is blown in under pressure and the passage *f'* is filled with a mixture of gas and air.

In a modified form of the burner (see Figs. 9 and 10) for use with gas under pressure the gas inlet pipe *d* is fitted with a nozzle or injector E' through which the supply of gas issues in a jet, and the passage *f'* is formed with an open or flaring air inlet *f*² to allow the air supply to be drawn in by the jet issuing from the nozzle E'. The supply of air is regulated by a regulating plate R placed over the nozzle E' and fitted on a pillar *r* as in Fig. 9. Or if desired a regulating plate R' of conical form and fitted upon the nozzle E' as in Fig. 10, may be employed. The regulator R or R'—as the case may be—is secured in position by a set screw or pinching screw *r'* and may be adjusted to or from the air inlet *f*² to admit a greater or less quantity of air according to the pressure, or velocity, or volume or weight of the gas jet issuing from the nozzle E'.

Beyond the passage *f'* a mixing chamber G is provided in which is arranged a baffle plate H having a conical projection *h* against which the air and gas impinge causing the mixed gases to flow outwardly in all directions and assuring a complete mixture. The chamber G extends out annularly at *g* beyond the baffle H and the gas and air flow around the baffle H and through holes *h'* therein into a passage through the center thereof to the delivery pipe *d*². The annular opening around baffle H is continued beyond opening *h'* as shown at *h*³. The baffle H is threaded into the chamber G and the outlet pipe is connected to the former by a union coupling *h*². The outlet pipe *d*² is fitted at its delivery end with a protecting block K which may be of cast iron and fits against a block *k* (see Figs. 1, 6 and 7) at the end of the heating inlet

C and the end of the heating inlet is preferably faced with a block *c* of heat resisting material. Or as shown in Fig. 8 the end of the heating inlet C may be plugged with
 5 a block *c'* into which the delivery pipe *d*² of the burner is fitted. Or any other suitable or convenient method of discharging the gas and air into the furnace may be employed.

10 What I claim as my invention and desire to protect by Letters Patent is:—

1. A gas burner of the type set forth comprising a casing having gas and air admission means, a receiving passage *f'* for the
 15 gas and air passed by said means, and a mixing chamber communicating with the discharge end of the receiving passage; a hollow baffle H arranged concentrically in the mixing chamber in spaced relation to the
 20 adjacent wall of the latter and provided at its upper end with a conical projection and on its sides with openings which afford communication between the mixing chamber and the interior of the baffle; and a delivery
 25 pipe *d*² for conducting the mixed air and gas from the interior of the baffle to the furnace.

2. A gas burner of the type set forth comprising a casing having gas and air inlets,
 30 a receiving passage *f'* for the gas and air and a mixing chamber G communicating with the discharge end of the receiving passage; a nozzle E connected to the air inlet and passing the air in the form of a jet
 35 to the receiving passage, the burner casing having a space concentric to the nozzle and

communicating at one end with the gas inlet and at the other end with the receiving passage; a hollow baffle H arranged concentrically in the mixing chamber in spaced
 40 relation to the adjacent wall of the latter and having openings which afford communication between the mixing chamber and the interior of the baffle; and a delivering pipe *d*² for conducting the mixed air and
 45 gas from the interior of the baffle to the furnace.

3. A gas burner of the type set forth comprising a casing having gas and air admission means, a receiving passage *f'* for
 50 the gas and air passed by said means, and a mixing chamber communicating with the discharge end of the receiving passage and having an annular pocket at the upper end thereof; a hollow baffle H arranged concentrically in the mixing chamber in spaced
 55 relation to the adjacent wall of the latter and provided at its upper end with a conical projection to deflect the gas and air issuing from said passage into said pocket, and on
 60 its sides with openings which afford communication between the mixing chamber and the interior of the baffle; and a delivery pipe *d*² for conducting the mixed air and gas from the interior of the baffle to the
 65 furnace.

In testimony whereof I affix my signature in presence of two witnesses.

E. RUSSELL BRAYSHAW.

Witnesses:

J. OWDEN O'BRIEN,
 HARRY BARNFATHER.