

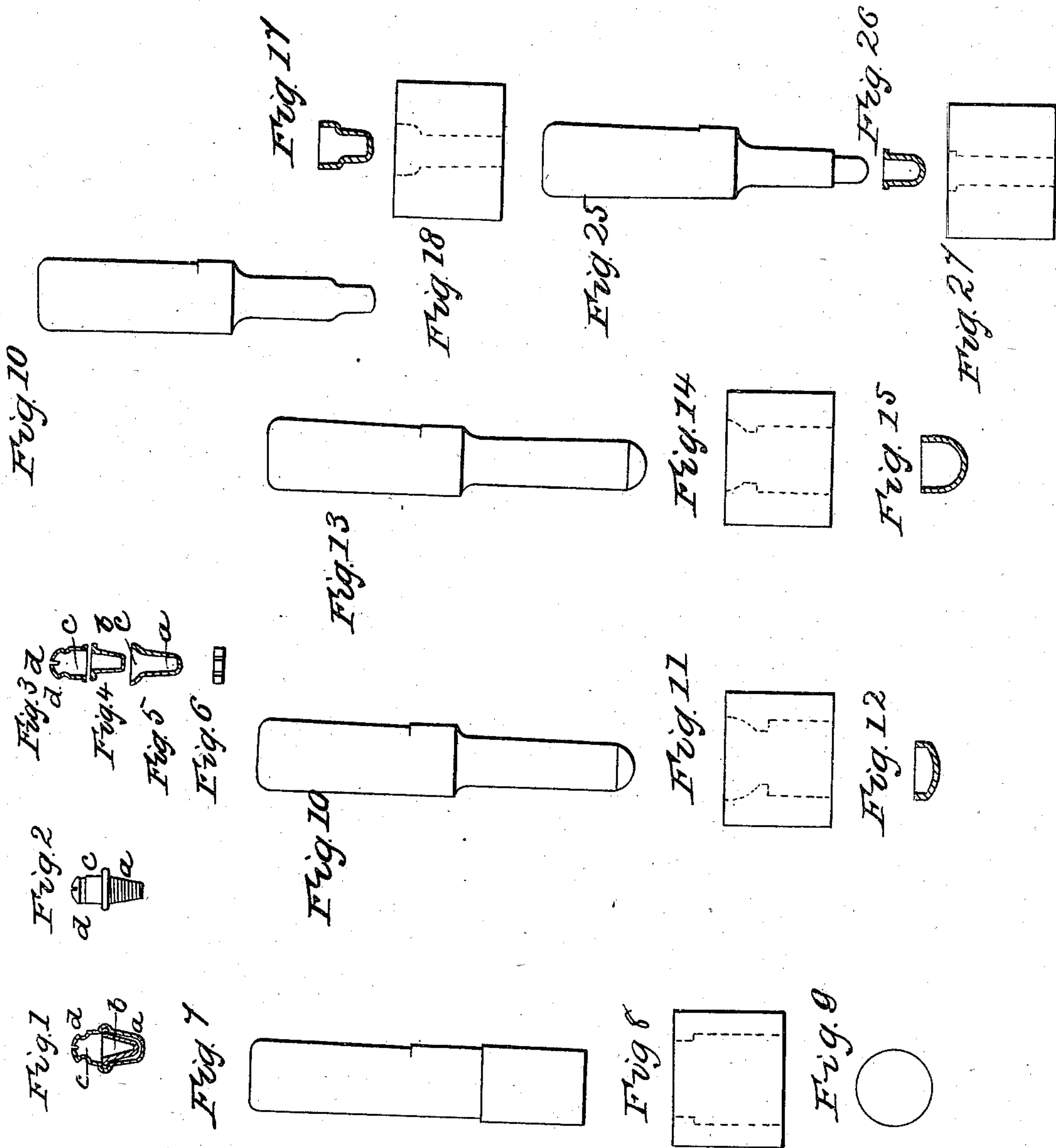
J. & J. WADSWORTH.

2 Sheets—Sheet 1.

Gas Burner.

No. 42,421.

Patented April 19, 1864.



WITNESSES

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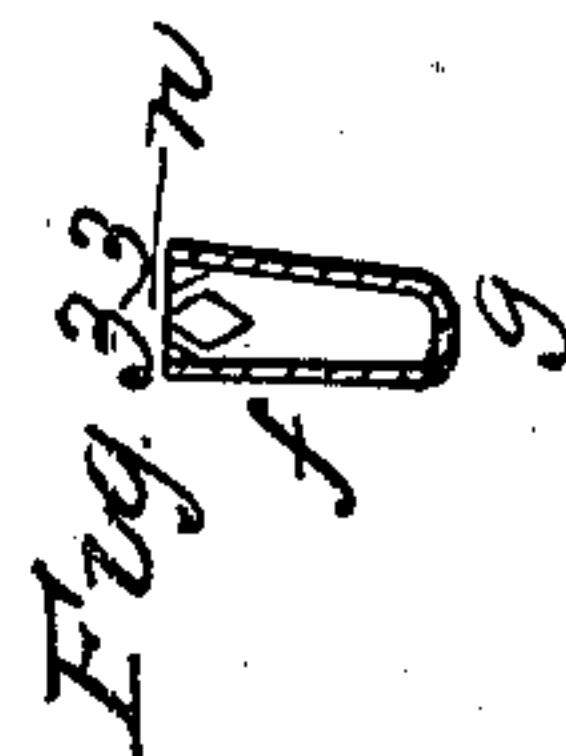
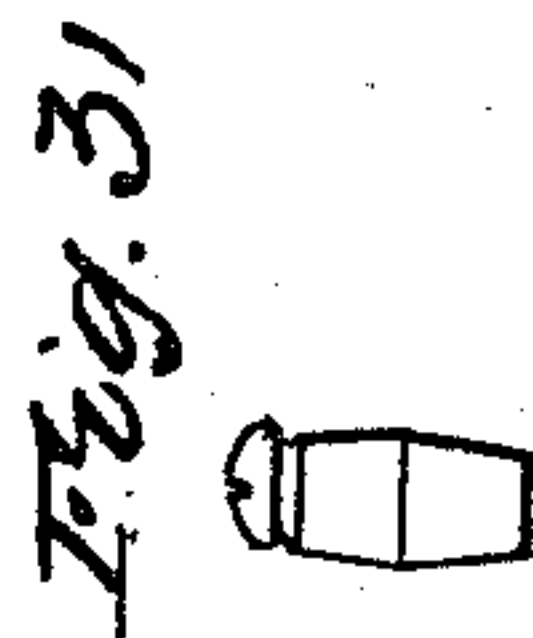
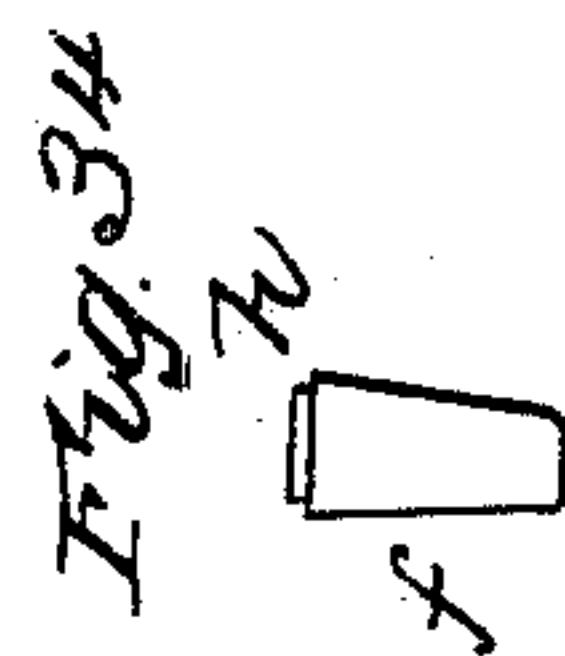
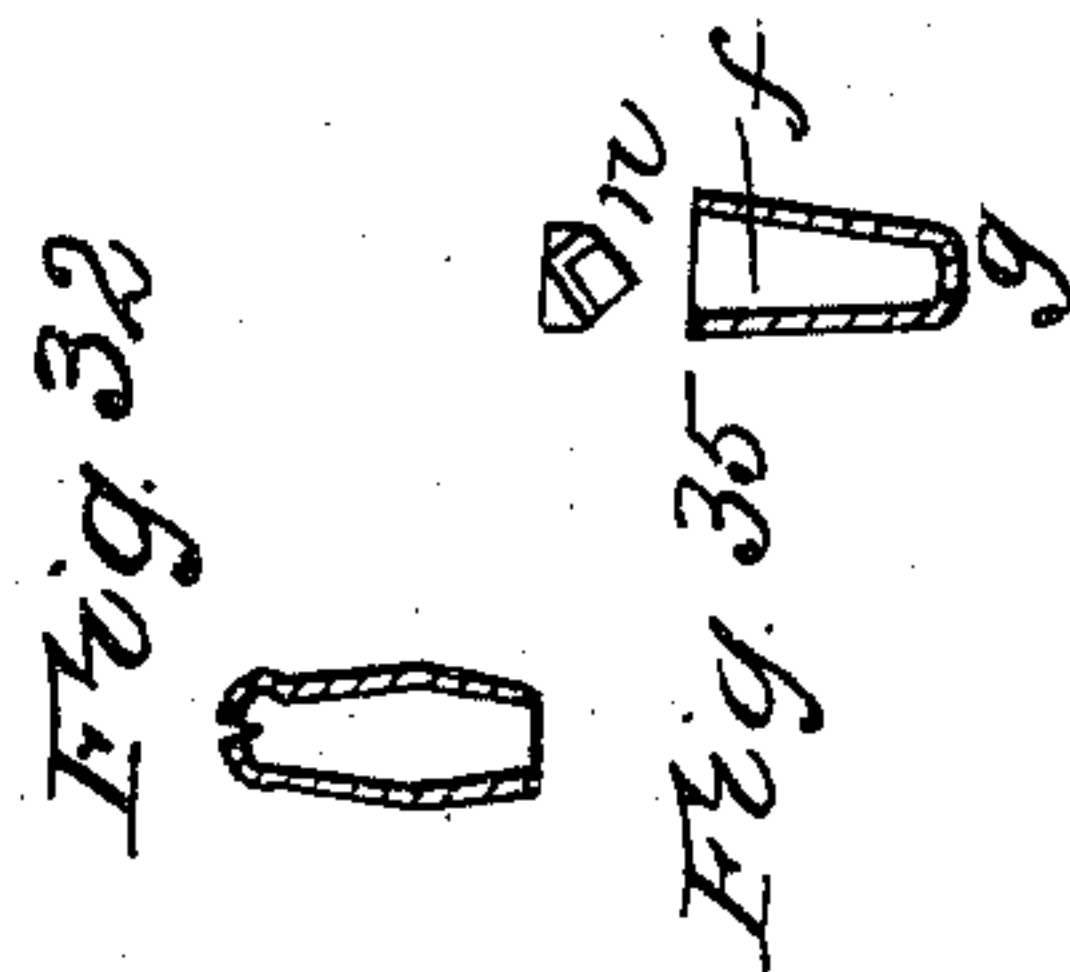
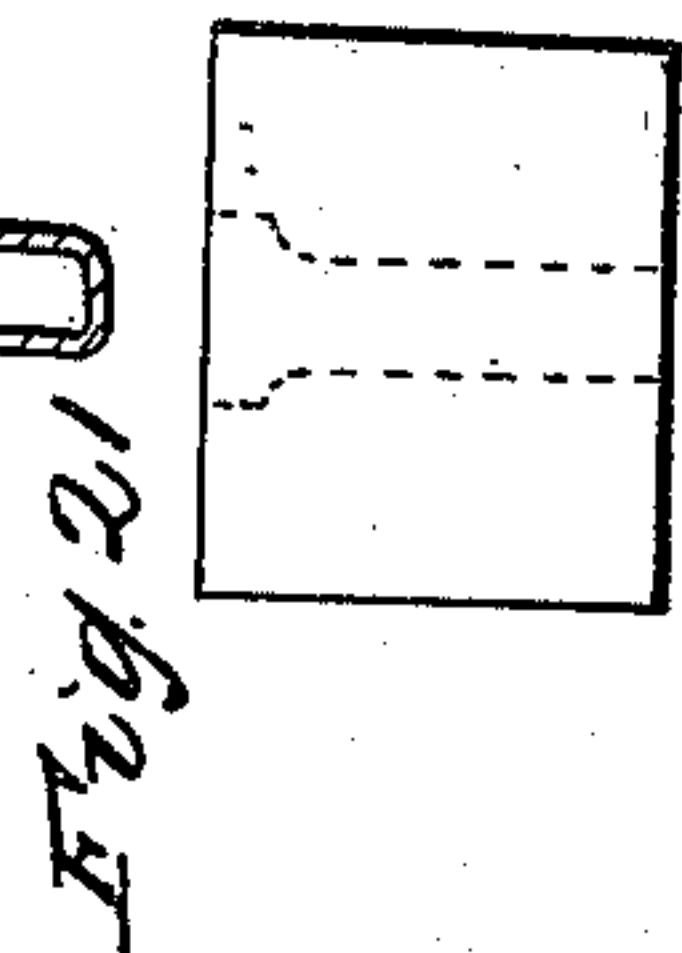
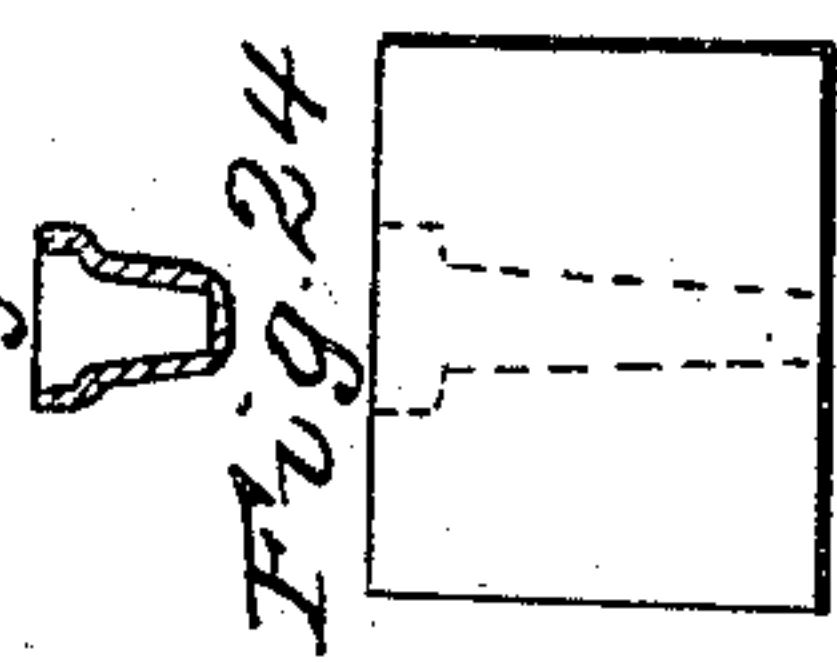
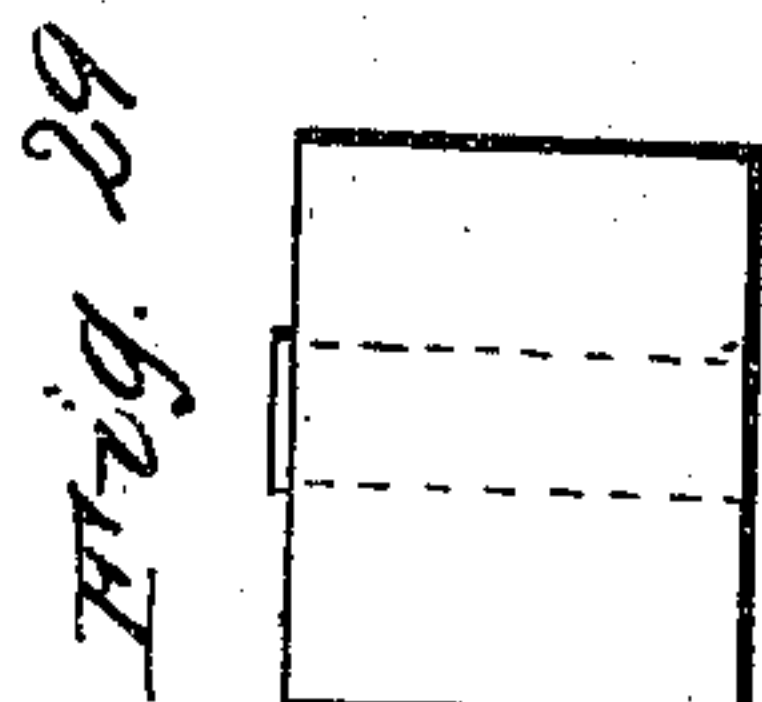
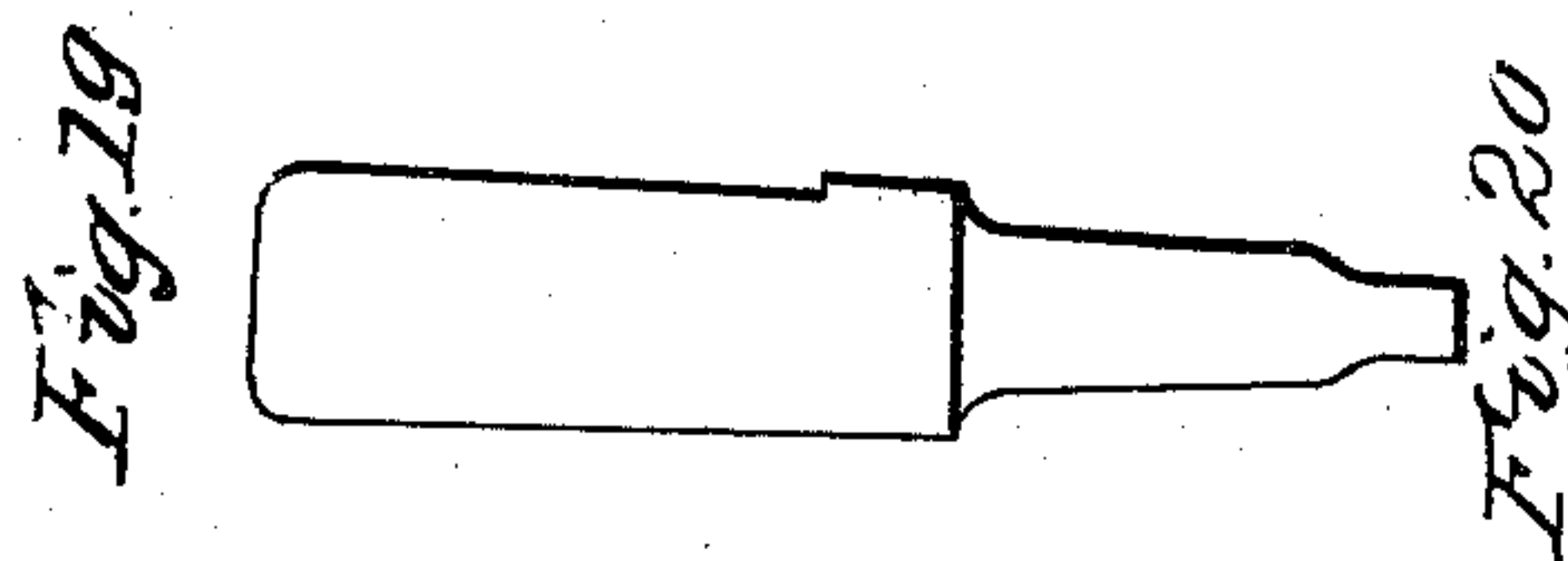
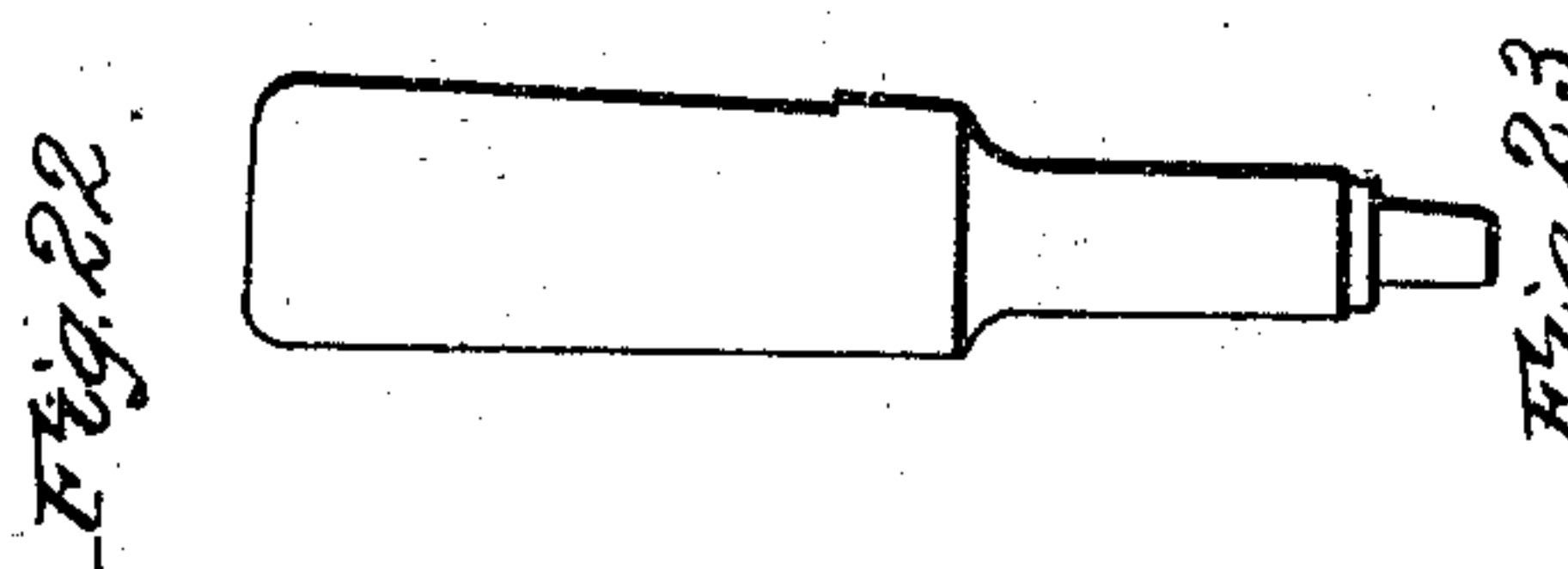
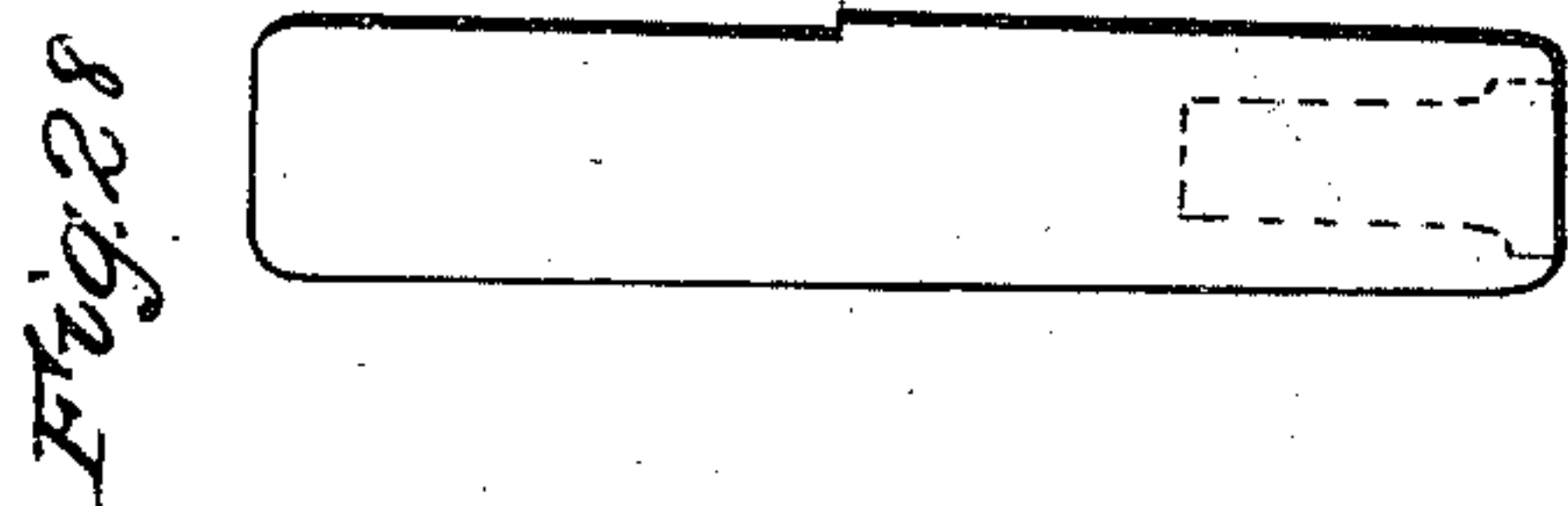
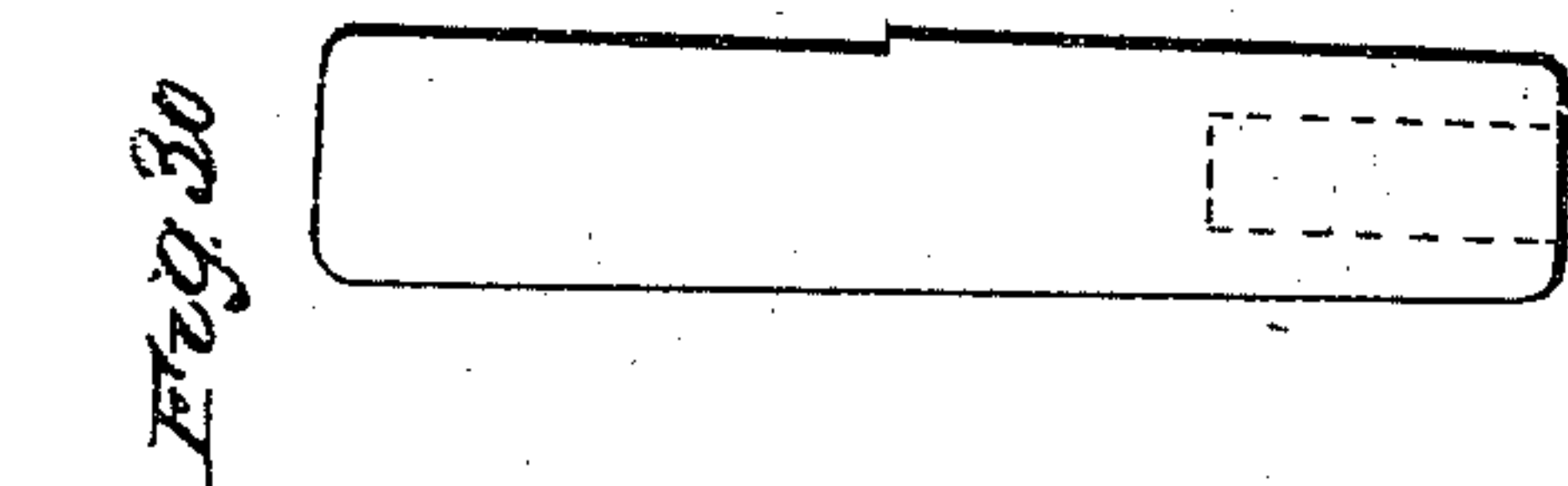
J. & J. WADSWORTH.

Gas Burner.

2 Sheets—Sheet 2.

No. 42,421.

Patented April 19, 1864.



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UNITED STATES PATENT OFFICE.

JOSEPH WADSWORTH, OF MARPLE, COUNTY OF CHESTER, AND JAMES WADSWORTH, OF SALFORD, COUNTY OF LANCASTER, ENGLAND.

IMPROVEMENT IN GAS-BURNERS.

Specification forming part of Letters Patent No. 42,421, dated April 19, 1864.

To all whom it may concern:

Be it known that we, JOSEPH WADSWORTH, of Marple, in the county of Chester, mechanic, and JAMES WADSWORTH, of Salford, in the county of Lancaster, machinist, both in the Kingdom of England, have invented a new and useful Improvement in Gas-Burners; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Our gas-burners are manufactured of sheet metal. We cut the burners or the parts thereof out of sheet metal, and impart the required configuration by drawing and pressing or stamping into or through dies or matrices, with punches, and generally, but not always, by the process known, as "knurling" or "milling," and the proper orifices made by sawing, punching, or drilling, the parts being finally united if formed separately.

Our invention consists in narrowing the pipe, stem, or tube of the burner a little below the apex thereof, so as to form a neck or contracted passage, above which the cavity is the same size as before the neck is formed. In this cavity is made the slot or orifice for the issue of the gas. The contraction of the neck produces a very superior form of light, and enables us to make the light a variety of shapes, and effects a more perfect combustion.

The nature and particulars of our invention will be clearly understood by the following description thereof, reference being had to the figures and letters on the accompanying sheet of drawings.

Figure 1 is a section, and Fig. 2 an external view, of an economical burner made of sheet metal; and Figs. 3, 4, 5, and 6 are views of detached parts of the same. The stem, pipe, or tube of the burner, which is inserted into the supply-pipe, is shown at *a*, in the interior of which is the plug *b* for checking the issue of the gas so that it may pass gradually to the upper chamber, *c*, which has a neck or contraction, *d*, and at the top the orifice at which the gas is ignited. The three parts are made separately, the top of the stem being formed with a flange or cup, *e*, Fig. 5, so as to hold the plug *b* and the chamber *c*, after which the upper edge of the cup is drawn over and

pressed down and unites the parts tightly together, as shown in Figs. 1 and 2.

In the manufacture of these burners, the first operation is to cut the sheet metal into round blanks by a punch and die. The punch is shown at Fig. 7, the die at Fig. 8, and the blank at Fig. 9.

The second operation is to push each blank through a die having a smaller hole, which raises the blank into a cup form. The punch is shown at Fig. 10, the die at Fig. 11, and the cup at Fig. 12. The cups are now annealed, and then each cup is forced or drawn through a die by a punch which draws the cup longer and thinner at the edges. The punch is shown at Fig. 13, the die at Fig. 14, and the cup at Fig. 15. The parts are again annealed, and each part is pressed into a die with a punch approaching the required configuration of that part of the burner. The punch is shown at Fig. 16, the part of the burner at Fig. 17, and the die at Fig. 18. The parts are again annealed, and each part pressed into a die with a punch nearer the required configuration. The punch is shown at Fig. 19, the part of the burner at Fig. 20, and the die at Fig. 21. Each part is now pressed into a die of the required size and shape with a punch corresponding to the die, the punch and die each having a cutting-edge to cut off the excess of metal. The punch is shown at Fig. 22, the part of the burner at Fig. 23, and the die at Fig. 24. The punch for making the nipple, or upper part of the burner, is shown at Fig. 25, the nipple at Fig. 26, and the die at Fig. 27. The nipples can be made from the parts shown at Fig. 17, and the upper end of each nipple is knurled or milled to form a neck or contraction at that part, as shown at *d*, Figs. 1, 2, and 3, after which the nipple at the top is sawed or punched for making the orifice. The plug *b*, Figs. 1, 4, and 6, is made from narrow strips of metal with a punch and die.

The punches and die for uniting the parts of the burners together are shown at Figs. 28, 29, and 30. The stem or tube is placed in the die, Fig. 29, and the plug and nipple inserted into the stem. The nipple is now pressed on the flange of the stem by the punch, Fig. 28, which draws in the upper edge of the stem, and then the edge pressed or flattened

down by the punch, Fig. 30, and thereby fastened tightly together.

Another form of sheet-metal burners is shown in Figs. 31 and 32, which burners can be made of the parts shown at Fig. 15, by drawing them longer and imparting the required configuration by dies and punches, the necks being formed by knurling or milling.

Having thus fully described our said invention, what we claim, and desire to secure by Letters Patent, is—

An improved gas-burner manufactured of sheet metal, having the nipple made of one

piece and knurled, milled, or spun in, so as to form a neck, leaving the cavity of the same size above the neck as below it, substantially as and for the purpose set forth.

Done at the city of Manchester, in the county of Lancaster and Kingdom of England, this 23d day of March, 1863.

JOSEPH WADSWORTH,
JAMES WADSWORTH.

In presence of—

EDWARD JOSEPH HUGHES,

JOHN BLOODWORTH,

Patent Agents, 20 Cross Street, Manchester.