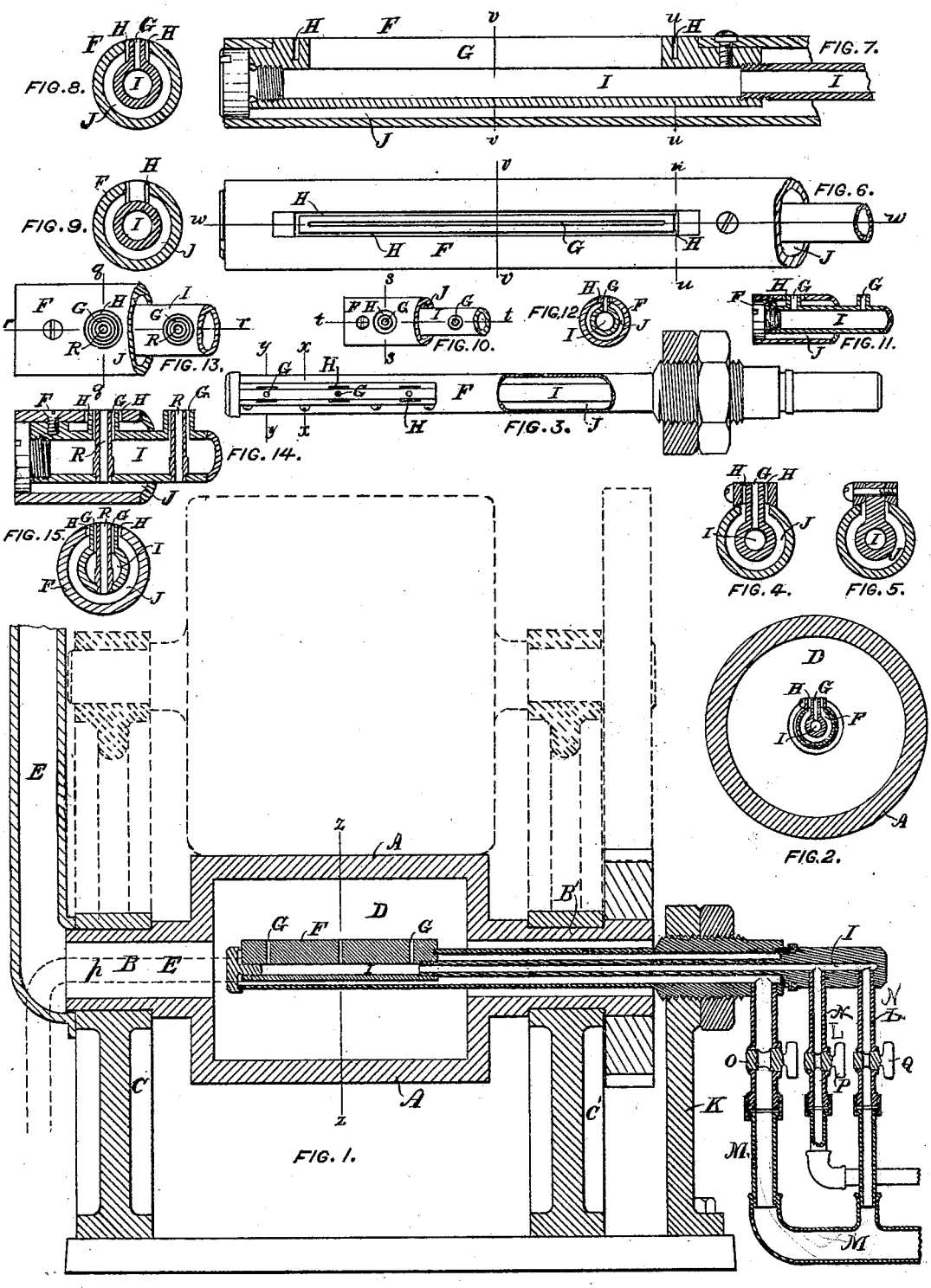
T. S. WILES.

Heater for Rollers, &c.

No. 165,775. Patented July 20, 1875.



WITNESSES:

Austin Ford Park
James Thorn Goodfellow.

INVENTOR:

Thomas Shires Wiles.

UNITED STATES PATENT OFFICE.

THOMAS S. WILES, OF ALBANY, NEW YORK, ASSIGNOR OF ONE-HALF HIS RIGHT TO ALONZO P. ADAMS, OF SAME PLACE.

IMPROVEMENT IN HEATERS FOR ROLLERS, &c.

Specification forming part of Letters Patent No. **165,775**, dated July 20, 1875; application filed June 26, 1875.

To all whom it may concern:

Be it known that I, THOMAS SHIRES WILES, of the city of Albany, in the county of Albany and State of New York, have invented certain new and useful Improvements in Gas-Burning Heaters for Rollers, Cylinders, Sad-Irons, Dies, and other devices for ironing, smoothing, pressing, drying, mangling, calendering, singeing, stamping, embossing, fluting, and finishing textile fabrics, wearing apparel, and other articles and materials, and for other purposes; and the following is a specification of my said invention, reference being had to the accompanying drawing.

Ironing or calendering rollers, sad-irons, and similar devices have been heretofore made or contrived with an interior chamber, an exit-passage for gaseous products of combustion, and a burner from which gas or mixed gas and air was to be discharged in a jet or jets and burned in the chamber, which had an opening or openings, through which air was to be admitted or blown into the chamber to assist in supporting the combustion of the jet or jets of gas or mixed gas and air therein. In such cases the air thus blown or simply admitted into the chamber was so indirectly, feebly, or imperfectly applied to the jet or jets of gas or mixed gas and air as to cause diffuse and incomplete combustion of the latter, or the evolution of smoke, or a lack in the development of heat by such combustion, and the principal object of my present invention is to obviate or lessen such defects.

One part of this invention consists of a burner having a jet-aperture or jet-apertures in communication with a supply of an inflammable mixture of gas and air which is under artificial pressure, and is thereby discharged in a jet or jets from the said aperture or apertures, in combination with another jet-aperture or jet-apertures arranged adjacent to and outside of the former, and in communication with a supply of atmospheric air which is under artificial pressure, and is thereby discharged from the latter aperture or apertures in a jet or jets immediately alongside and outside of the said jet or jets of mixed gas and air, so as to directly and strongly assist in supporting the combustion of the latter, and in directing and strengthening the flame thereof, whether the burner be used in the open air or otherwhere.

Another part of this invention consists in the combination, with a chamber having an exit-passage therefrom for gaseous products of combustion, of a burner having an aperture or apertures, from which an inflammable mixture of gas and air, with or without an addition of oxygen, is discharged into said chamber in a jet or jets, and also having another aperture or apertures, from which air under artificial pressure, and with or without an addition of oxygen, is discharged into the said chamber in a jet or jets immediately alongside and outside of the said jet or jets of mixed gas and air, so as to thereby directly and effectually support and strengthen the combustion of the latter in the chamber, and protect the flame thereof from the smothering gaseous products of such combustion, and insure the quick discharge of such stifling gaseous products from the combustion-chamber.

Another part of this invention consists in the combination, with a roller having a combustion-chamber therein and an exit-passage therefrom for gaseous products of combustion, of a burner located in the said chamber in the roller, and having a jet-aperture or jet-apertures directly open to the said chamber, and in communication with a pipe or conduit for supplying inflammable gas or mixed gas and air from a reservoir or source outside of the roller, and the said burner also having another jet-aperture or jet-apertures arranged adjacent to and outside of the former, and directly open to the said combustion-chamber, and in communication with a pipe or passage for conducting to the latter aperture or apertures a supply of air from a source outside of the said combustion-chamber, so that while the roller is revolving a jet or jets of inflammable gas or mixed gas and air shall be discharged from the said burner into the chamber in the roller, and at the same time air shall be delivered from the burner into the same chamber, and in a jet or jets immediately alongside and outside of the said jet or jets of gas or mixed gas and air, and shall effectually support or assist

the combustion of the latter jet or jets, and protect the same from the smothering gaseous products of such combustion within the roller.

In the aforesaid drawing, Figure 1 is a central longitudinal section of an ironing or calendering roller with a burner formed and combined therewith according to my present invention. Fig. 2 is a section of the same roller and burner at the line *z z* in Fig. 1. Fig. 3 is a plan of the same burner, with its gas and air supplying pipes, a part of one pipe being broken away. Fig. 4 is a section of the same burner, on a larger scale, at the line *y y* in Fig. 3; and Fig. 5 is a section of the same burner, on a like scale, at the line *x x*. Fig. 6 is a plan, Fig. 7 a longitudinal section at the line *w w*, Fig. 8 a cross-section at the line *v v*, and Fig. 9 a cross-section at the line *u u*, of another burner suitable for use in carrying out this invention. Fig. 10 is a plan, Fig. 11 a longitudinal section at the line *t t*, and Fig. 12 a cross-section at the line *s s*, of a part of another form of burner that can be used instead of either of the aforesaid burners. Fig. 13 is a plan, Fig. 14 a longitudinal section at the line *r r*, and Fig. 15 a cross-section at the line *q q*, of a part of another style of burner, which may be used in carrying out my invention.

A represents a smooth-surfaced metallic roller, having hollow journals B B′ in boxes on standards C C′. The dotted lines over the roller A in Fig. 1 indicate a clothed roller, mounted and geared in connection with the roller A, for use in ironing, smoothing, or finishing textile fabrics, wearing apparel, and similar articles and materials. The roller A has within it a combustion-chamber, D, with a discharge-passage, E, for gaseous products of combustion. F is a burner arranged in the chamber D in Figs. 1 and 2, and having a jet-aperture or jet-apertures, G, and another jet-aperture or jet-apertures, H, adjacent to and outside of the aperture or apertures G. Each aperture G of the burner is in communication with a pipe or passage, I, and each aperture H is in communication with a pipe or conductor, J, and the pipes or conduits I and J in Fig. 1 extend through the hollow journal B′ of the roller, and are secured to a standard, K, so as to support the burner in the chamber in the roller, and independently of the latter, so that the roller can be revolved while the burner remains stationary; but the burner may be supported in the roller by any other suitable means. Instead of having both pipes I and J extend through one and the same hollow journal, one of those pipes may extend through the hollow journal B′, and the other through the hollow journal B, as indicated by dotted lines at *p*. The pipe I has communication with any suitable or well-known source, supply, or reservoir (not shown) of inflammable gas or mixed gas and air, with or without added oxygen, by means of a pipe, L, (shown only in part,) or by any suitable conductor, whereby such gas or mixed gas and air will be supplied to the aperture or apertures G of the burner, and discharged therefrom into the chamber D in the roller, and in a jet or jets suitable for burning therein. The pipe or passage J has communication with any suitable supply or reservoir (not shown) of atmospheric air, with or without added oxygen, by means of a pipe, M, only partly shown, or by any suitable means, whereby atmospheric air will be supplied to the aperture or apertures H of the burner, and discharged therefrom into the chamber D in a jet or jets immediately alongside and outside of the jet or jets of gas or mixed gas and air issuing from the aperture or apertures G, and so as to directly and effectually assist or support the combustion of the latter jet or jets in the chamber D, and also protect the flame of such combustion from being diffused and smothered by the gaseous products thereof, and also insure or assist in the discharge of such gaseous products through the exit-passage E, which may or may not be connected with a chimney, draft-fan, or other suitable draft-producing device.

A fan-blower is preferably used to take air from the atmosphere and force it into the pipe M, and thence through the passage J, and under artificial pressure in a jet or jets from the aperture or apertures H. The gas may be introduced into and passed through the pipe I, and discharged under artificial pressure in a jet or jets from the aperture or apertures G by connecting the pipe L with a gasometer or a pipe supplying ordinary illuminating-gas, and air can be mixed with the gas in a gasometer, or by admitting air from the atmosphere through a hole or holes in the pipe L, as in the well-known Bunsen burner, or preferably by connecting the pipe I by a pipe, N, with the air-supply pipe M, so that air shall be introduced into and mixed under artificial pressure with the gas in the passage I. The supply-pipes should have valves or cocks O P Q, by which the quantities of air and of gas, or mixed gas and air, issuing from the jet-apertures G and H of the burner can be regulated and controlled.

The apertures G and H of the burner may be of any suitable size, shape, and number; but in all cases the aperture or apertures for discharging the jet or jets of air must be arranged adjacent to and outside of the aperture or apertures for discharging the jet or jets of gas or mixed gas and air. In some cases, as indicated by Figs. 13, 14, and 15, a jet of air may be discharged from the burner by an aperture, R, inside of each aperture G for gas or mixed air and gas.

In carrying out this invention any suitable inflammable gas or gaseous compound or mixture may be used—such as common illuminating coal-gas, carbureted hydrogen, vapor of hydrocarbon liquids, atmospheric air charged with hydrocarbon vapor, or hydrogen; and I generally greatly prefer to have atmospheric air or oxygen, or air and oxygen, mixed with

whatever gas or gaseous mixture or compound is used, in order to increase the development of heat, and to lessen or prevent the liberation of smoke or soot when coal-gas or other hydrocarbon gas or vapor is used.

What I claim as my invention is—

1. A burner having a jet-aperture in communication with a supply of mixed gas and air under artificial pressure, and an adjacent outside jet-aperture in communication with a supply of air under artificial pressure.

2. In combination with a chamber having an exit-passage, a burner having an aperture from which a jet of mixed gas and air is discharged into said chamber, and an aperture from which air under artificial pressure is discharged into said chamber in a jet alongside of the said jet of mixed gas and air.

3. In combination with a roller having a chamber therein, and an exit-passage therefrom, a burner in said chamber, and having a jet-aperture in communication with a conduit for supplying gas or mixed gas and air, and also having an adjacent outside jet-aperture communicating with an air-supply passage, substantially as set forth.

In testimony whereof I hereunto set my hand in the presence of two subscribing witnesses this 23d day of June, 1875.

THOMAS SHIRES WILES.

Witnesses:
AUSTIN FORD PARK,
JAMES THORN GOODFELLOW.