(No Model.) 2 Sheets—Sheet 1.

J. S. GEORGE, Jr.

BURNER FOR ROLLS OF BURNISHING MACHINES.

No. 489,299. Patented Jan. 3, 1893.

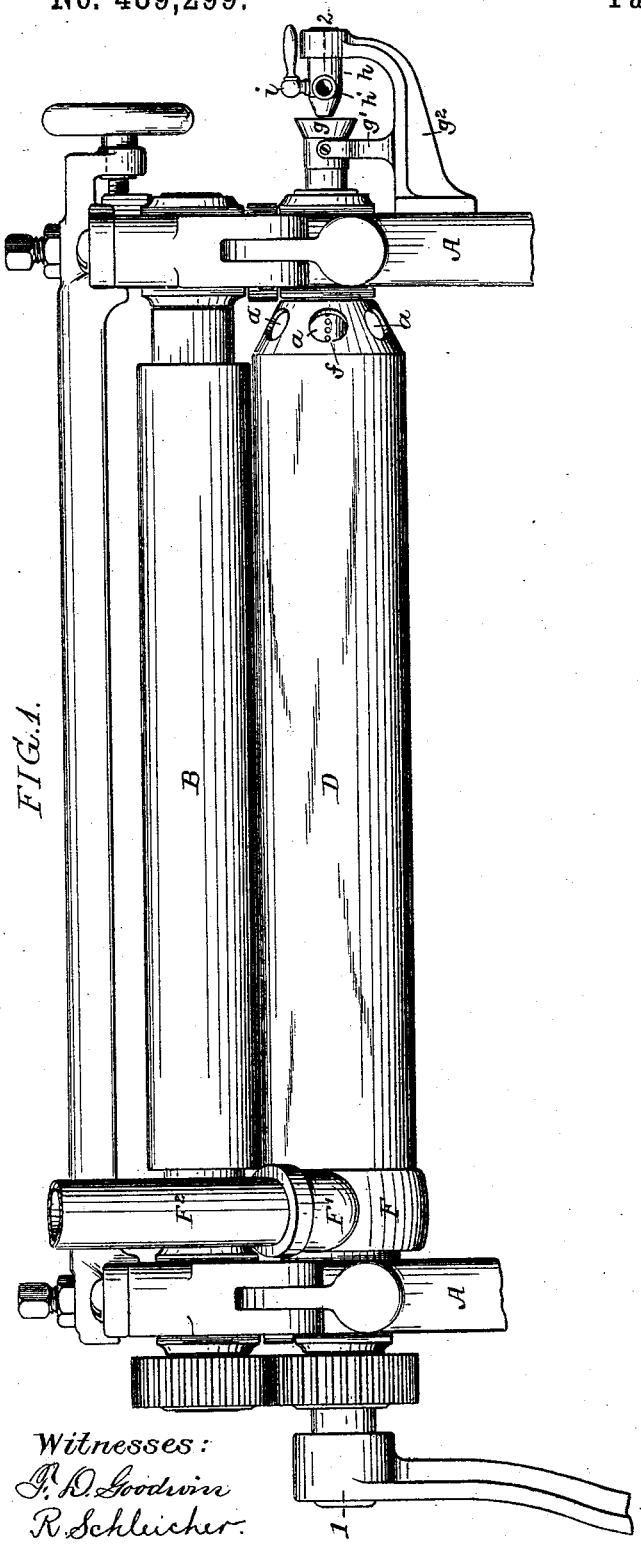

FIG. 1.

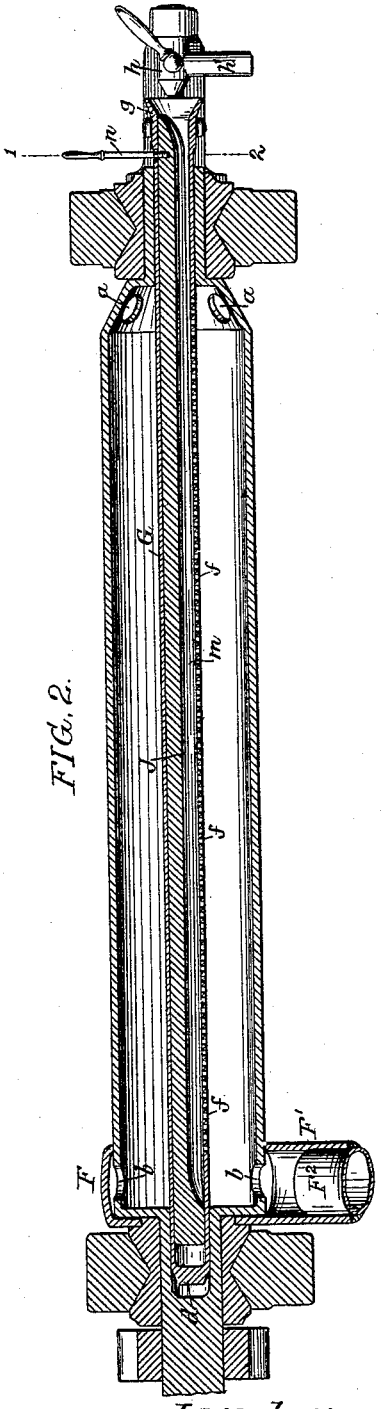

FIG. 2.

Witnesses:
J. D. Goodwin
R. Schleicher.

Inventor:
James Scott George, Jr.
by his Attorneys
Howson & Howson

(No Model.) 2 Sheets—Sheet 2.

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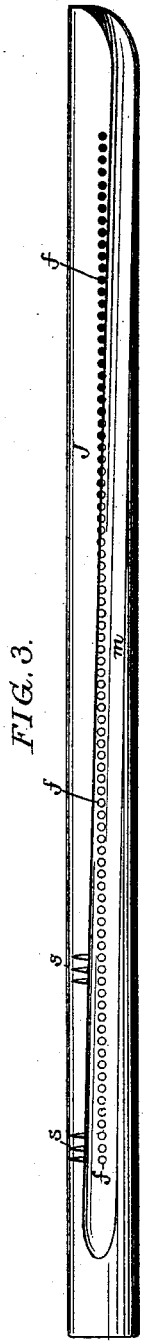

FIG. 3.

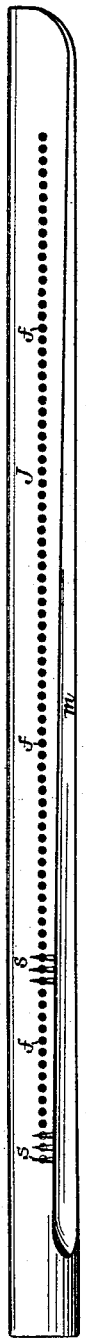

FIG. 4.

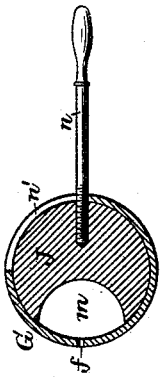

FIG. 5.

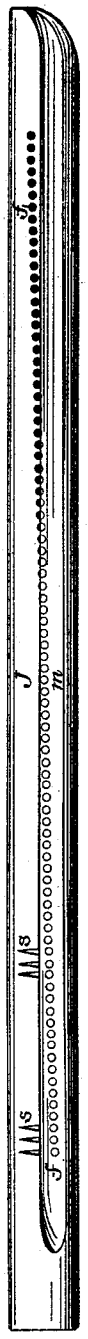

FIG. 6.

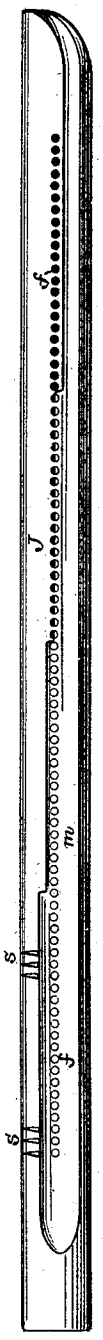

FIG. 7.

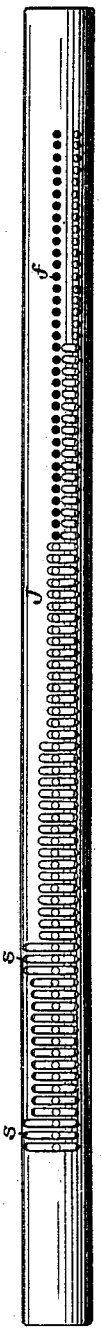

FIG. 8.

Witnesses:
G. D. Goodwin
R. Schleicher.

Inventor:
James Scott George, Jr.
by his Attorneys
Howson & Howson

UNITED STATES PATENT OFFICE.

JAMES SCOTT GEORGE, JR., OF PHILADELPHIA, PENNSYLVANIA.

BURNER FOR ROLLS OF BURNISHING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 489,299, dated January 3, 1893.

Application filed July 8, 1892. Serial No. 439,319. (No model.)

To all whom it may concern:

Be it known that I, JAMES SCOTT GEORGE, Jr., a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Burners for Rolls of Burnishing-Machines, of which the following is a specification.

My invention relates to that class of burnishers in which the burnishing roll is heated by an internal burner supplied with inflammable gas or vapor, the object of my invention being to so construct such a roll heater that the heat can be applied with full force to that end of the roll which is remote from the air inlets or can be distributed throughout different portions of the roll as desired. This object I attain in the manner hereinafter set forth, reference being had to the accompanying drawings in which—

Figure 1, is a front view of sufficient of a burnishing machine to illustrate my invention; Fig. 2, is a sectional plan view, partly in elevation, on the line 1—2, Fig. 1; Figs. 3 and 4, are diagrams illustrating a special feature of the invention; Fig. 5, is an enlarged transverse section on the line 1—2, Fig. 2; and Figs. 6, 7 and 8, are diagrams illustrating modifications of the invention.

In Fig. 1, A A represent parts of the opposite frames of a burnishing machine, and B and D respectively the upper and lower rolls of the same, these rolls being geared together so as to rotate at differential surface speed, the upper roll having a feeding surface, and the lower roll being polished or burnished so as to act upon the face of the photograph or other object to be acted upon in order to calender or burnish the same. The lower or burnishing roll is hollow and has at one end air inlet openings *a* and at the opposite end outlet openings *b* which communicate with a hollow ring F surrounding the end of the roll and secured in any suitable way to the box which constitutes the bearing for the spindle at this end of the roll, said hollow ring having a branch F′ from which extends a spout F^2 so as to cause a draft of air through the roll D from one end to the other in order to support combustion therein.

Extending through the outer journal of the roll D is a tube G which is supported in a recess *d* in the inner journal and has along one side a row of perforations *f*, the outer end of said tube G projecting beyond the journal of the roll D and having a flaring mouth *g* which is supported in a forked standard *g′* mounted upon a bracket g^2 projecting outward from one of the side frames A of the machine. The bracket g^2 carries at the outer end a nozzle *h* which has at one side a branch *h′* for the reception of a flexible tube or other means of conveying inflammable gas or vapor to the nozzle, a valve *i* in the nozzle serving to control the volume of the jet of such inflammable gas or vapor issuing from the nozzle and directed thereby into the flaring mouth of the perforated tube G. Within this tube G is a grooved rod J, the groove *m* of the rod extending from the outer end of the same almost to the inner end and being flared or enlarged at the outer end so that the jet issuing from the nozzle H is received in said groove and is directed thereby along the perforated side of the tube G. The groove *m*, or at least one edge of the same, is inclined in respect to the line of perforations *f* formed in the tube G so that by turning the rod J in the tube the perforations at and near the outer end of the roll D may be covered or partially covered without covering those perforations which are at the center or inner end of the roll, and hence more remote from the air inlet openings *a* of said roll. This will be understood on reference to Fig. 3 in which the row of circles represents the row of perforations *f* in the tube G, the black circles representing those which are covered. The object of this construction is to provide for proper combustion of the gas or vapor at the inner portions of the roll, for when said gas or vapor escapes from the entire line of perforations in the tube G those jets which are nearest the air supply end of the roll D so deprive the incoming volumes of air of their oxygen that said air is not, when it reaches the inner portion of the roll, adapted to effect perfect combustion of the jets issuing from the perforations at the inner portion of the tube G, but by cutting off the perforations at the outer end of the roll, after said roll has been sufficiently heated at that end, the entire volume of flame may be confined to the central and inner portions of the roll until the latter are

properly heated, hence by proper adjustment of the rod J, uniform heating of all parts of the roll D may be effected.

Adjustment of the rod J is effected by means of a handle *n* projecting from said rod through a suitable segmental slot *n'* in the outer projecting portion of the tube B, as shown in Fig. 5.

Communicating with the inner portion of the groove *m* are short lateral grooves or channels *s* which serve to convey the gas or vapor to certain of the perforations *f* at the inner end of the tube G even when the rod J is so turned as to cut off all of said perforations from direct communication with the groove *m*, a limited number of jets being thus provided within the roll for the purpose of igniting the main jets when the rod G is again turned so as to open the perforations *f*.

Although I prefer, in carrying out my invention, to form a straight line of perforations in the tube G and to incline the groove *m*, it will be evident that the construction might be reversed without departing from my invention, that is to say, the groove in the rod J might be straight or parallel with the axis of the roll and the line of perforations *f* in the tube G might be inclined in respect thereto, as shown for instance in Fig. 6, or, if desired, the groove in the rod J might be stepped instead of inclined so that by turning the said rod one section after another of the line of perforations *f* might be cut off from communication with the groove, as shown in Fig. 7, or the rod J might be hollow and might have perforations graduated in width so as to cut off section after section of the tube G, as shown in Fig. 8.

Having thus described my invention I wish it to be understood that I do not claim a nozzle for injecting gas or vapor into a perforated burner tube contained within the roll to be heated, as such a form of roll heater has been known for many years, nor do I claim a burner consisting of concentric tubes with registering rows of perforations some of which are wider than others, in order to provide for the maintenance of igniting jets from some of the perforations after the other perforations have been moved out of register so as to cut off the flow therefrom, as such construction is found in prior patents, for instance in Patent No. 312,976 dated February 24, 1885. The purpose of the inclined groove or equivalent constructions in my improved burner, is distinct from that of maintaining the igniting jet or jets, that is to say, it is intended for maintaining the full flow of gas or vapor from the perforations at the center and back end of the roll while cutting it off from the front or inlet end of the roll.

I therefore claim as my invention, and desire to secure by Letters Patent:—

1. The combination in a burner for heating hollow burnishing rolls, of the burner tube having a row of perforations therein, and the valve rod located within the burner tube and having a longitudinal groove or equivalent construction whereby gas or vapor introduced into one end of the burner tube may be directed to the perforations of said tube, said groove and row of perforations being inclined in respect to each other so that the perforations near the inlet end of the burner can be closed without closing those near the center of the burner or the end remote from the inlet, substantially as specified.

2. The combination in a burner for heating hollow burnishing rolls, of the burner tube having therein a row of perforations parallel with the axis of the tube, and the internal valve rod having a groove one edge of which is inclined in respect to said row of perforations, substantially as specified.

3. The combination in a burner for heating hollow burnishing rolls, of the perforated burner tube, the grooved valve rod therein, and a nozzle for directing a jet of gas or vapor into the groove in said rod, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES SCOTT GEORGE, JR.

Witnesses:
JNO. E. PARKER,
H. F. REARDON.